The Effectiveness of Profiling from a National Security Perspective

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Summary

Summary of the issue

- The context of this report is one where security agencies need tools to ensure national security, yet where some sensitivity exists with respect to the rights protected by the *Canadian Human Rights Act;*
- Specifically, this report examines whether profiling constitutes a valid and effective means for the State to maintain national security.

Methodology framework

- Three main methods were used to identify the 277 documents compiled: (1) access to computerized data banks and document search engines, (2) the "snowball" method in which references for previously obtained texts are consulted, and (3) recommendations made by experts in various fields;
- Although the texts consulted covered a range of disciplines, they focused mainly on criminology, psychology, and law;
- They cover the time span from 1965 to 2008 and discuss profiling experiences in ten countries over four continents;
- The literature review involved consulting various types of documents, the majority of which were scientific articles published in peer-reviewed journals;
- Empirical treatment, which is based on data collection and analysis, was applied to the assessment of the effectiveness of profiling;
- Analysis of the documents gathered was based on two criteria: level of evidence and strength of evidence. Studies with major deficiencies in methodology that undermined credibility were systematically eliminated.

Behavioural profiling

- "Criminal profiling can be defined as a technique that helps identify a suspect's main personality traits and behavioural characteristics, based on the elements of the crime he has committed" (Beauregard and Proulx, 2001, p. 20).
- In Canada, behavioural analysis units perform the following duties: develop profiles of unidentified offenders, analyze crime scenes, reconstruct crime scenes, conduct indirect personality assessments, provide advice on investigations and interrogations, assist in the execution of search warrants, analyze statements or testimony, analyze suspicious deaths, conduct threat assessments and promote services offered;
- Since 1992, the training of profilers in North America has been the responsibility of the International Criminal Investigative Analysis Fellowship (ICIAF);
- Profiling is used most often in cases where police have few clues that could help solve a case. The goal of profiling is not to directly identify the person responsible for the crime, but rather to predict the most probable characteristics of the criminal sought;

- The practice of profiling is based on certain premises: (1) human behaviour is predictable, (2) offenders commit their crimes in a consistent manner and can be distinguished from other offenders, and (3) the way they commit their crimes relates to their personal characteristics;
- Criminal profiling is currently used in three phases of the criminal justice process: investigation, arrest and trial;
- In Canada, three agencies have a section dedicated to criminal profiling: the RCMP's Special Services and Behavioural Sciences Branch, the Sûreté du Québec's Behavioural Analysis Service, and the Ontario Provincial Police's Behavioural Sciences Section;
- We cannot conclude that behavioural profiling functions in a systematic manner. However, there is anecdotal evidence that profiling *may* work;
- The literature is replete with approaches and typologies, but these models lack a theoretical basis and empirical validation. For these reasons, none of the proposed models can be considered "scientific";
- Few empirical studies meet the rigorous criteria of credible scientific research. We are of the view that profiling may possibly contribute to police investigations, but it is still more of an art than a science;
- However, we are of the opinion that profiling methods should be formalized, performance criteria should be developed, and empirical research should be undertaken to measure the true effectiveness of criminal profiling in Canada.

Geographic profiling

- Geographic profiling may be defined as "... an information strategy for […] crime investigations that analyses crime site information to determine the most probable area of offender residence" (Rossmo, 2000, p.259).
- Its use is based on certain premises, namely: (1) the profile must be based on multiple crime scenes (several crimes committed by the same individual or several sites linked to the same crime); (2) the crime scenes must be linked to the same offender; (3) the offender's residence (or base of operations) and his area of criminal activity need to be a short distance apart; (4) the crime scenes must be fairly evenly distributed around the offender's home or anchor point; and (5) the offender cannot move from one anchor point to another or operate from multiple anchor points during his or her crime series;
- The potential effectiveness of geographic profiling in terms of reducing search areas has been demonstrated empirically.
- Police knowledge of a limited number of simple heuristics seems to lead to results equivalent to those obtained by software.
- The practice of geographic profiling actually consists of two stages: (1) attribution of a series of crimes to the same offender, and (2) establishment of a geographic profile defining the search area. Although it has been empirically demonstrated that the second stage may be accomplished relatively efficiently, research cannot determine the ability of investigators to complete the first stage.

Prospective profiling

- The basic principle of prospective profiling "is to develop correlations between specific criminal activity and certain group-based traits in order to help the police identify potential suspects for investigation. [Prospective] Criminal profiling uses probabilistic analysis in order to identify suspects and target them for surveillance" (Harcourt 2003, p. 109);
- The practice of prospective profiling relies on two basic premises: (1) the rate of criminality of the members of certain social groups is proportionately higher than their representation in the general population, and (2) if such a situation is observed, it is fair and effective to target these groups in proportion to their rate of criminality in allocating police resources;
- In addition to these two premises, it is presumed that criminals act rationally and will react accordingly to the fluctuation in the probability of being caught. This is the logic of deterrence: the assumption is that if the probability of being arrested for a crime increases for a given group, the crime rate will decrease accordingly;
- Of all the fields studied, there is practically no empirical support for the effectiveness of prospective profiling;
- There do not appear to be any exceptions to the finding that the actuarial approach is more effective than heuristic profiling;
- No statistical link has been able to be convincingly established between an ethnic group and a given type of crime ;
- Profiling based wholly or partly on sociodemographic characteristics is particularly sensitive to various forms of substitution, which for criminal organizations involves changing the profile of their agents;
- Our review of scientific literature has therefore not allowed us to legitimize the practice of prospective profiling on scientific, legal or moral grounds, or to advocate threat assessment for events that, statistically speaking, are extremely rare.

Judgment in uncertainty

- Judgmental heuristics are a type of cognitive shortcut for quickly assessing a situation: "The term *judgmental heuristics* refers to a strategy—whether deliberate or not—that relies on a natural assessment to produce an estimation or a prediction" (Tversky and Kahneman 2002, p. 20);
- Heuristics, as opposed to solely analytical or rational models, better reflect the way people operate in real decision-making situations;
- However, these heuristics lead to predictable biases. Some of the most well-documented biases include representative bias, weighting bias, cognitive availability bias and mental contamination;
- Despite these biases and the fact that they frequently lead to erroneous predictions, both men and women are frequently overconfident in their ability to predict rare events;

- These biases have been studied in various clinical judgment contexts, where it has been demonstrated that clinical judgment had been systematically surpassed by actuarial judgment;
- Quite early in the analytical process, clinicians often form an implicit hypothesis that subsequently guides their search for information and its interpretation. This bias has also been observed in investigations.

General conclusion

- The systematic effectiveness of criminal profiling has not been empirically demonstrated. However, we cannot therefore conclude that the practice has no merit;
- Profiling may possibly be seen as an art that is useful to the police investigation process, but it cannot currently claim to be a science;
- More substantial effort has been made to conceptualize geographic profiling and provide solid empirical support for narrowing a search area based on the geographic location of crime scenes;
- However, research fails to determine how successfully analysts are able to attribute a series of crimes to one offender (linkage analysis);
- Prospective profiling should be separated into two categories: profiling of frequent incidents, and profiling of low base-rate incidents;
- In the first case, it has been shown that a clinical approach or simple heuristic profiling is ineffective. This observation promptly led to the adoption of actuarial risk assessment measures, which have been clearly proven to be more effective;
- In the second case, particularly rare incidents, no empirical research could be found to support the use of profiling or actuarial risk assessment.

Recommendations

[R1] – Inferential methods in behavioural profiling should be formalized and recorded (which does not mean, we should point out, that they must be made public, as criminals would then come up with a method to defeat them).

[R2] – Performance criteria should be developed to evaluate the true effectiveness of behavioural profiling.

[R3] – Research should be undertaken to empirically evaluate the effectiveness of behavioural profiling in the Canadian context. This research should cover three particular aspects: 1) the performance of profilers compared to that of detectives who do not have such training (in order to establish the added value of profiling for conventional investigation methods), 2) profile accuracy (by comparing profiler predictions to offender characteristics in solved cases), and 3) the actual contribution of profiling to suspect identification and arrest.

[R4] – The way in which geographic profiling coordinates are selected and entered should be standardized (for example, if an altercation starts in a bar, continues outside and ends in a homicide a few blocks away, which coordinate(s) mark the crime scene?)

[R5] – Research should be undertaken to evaluate the performance of analysts in the first stage of geographic profiling (attribution of crimes to the same suspect).

[R6] – Agencies should continue to use actuarial methods rather than prospective profiling or clinical judgment for threat assessment.

[R7] – To optimize threat assessment, particularly with respect to terrorism, it is crucial for agencies to have credible, current and relevant information. Intelligence services should have a way to obtain this information in Canada as well as abroad, while respecting the Constitution and international law.

[R8] – The sharing of intelligence among agencies, particularly the RCMP, CSIS and the CBSA, should be encouraged and optimized.

[R9] – Performance criteria should be developed for the various actuarial tools used by the agencies. The actual effectiveness of instruments should be periodically evaluated (which ties in with a recommendation in the 2007 report by Auditor General S. Fraser with respect to the CBSA).

[R10] – Ethical standards should be developed to govern the practice of threat assessment from an actuarial perspective.

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List of acronyms

BAU	Behavioral Analysis Unit
BKA	Bundeskriminalamt
CBSA	Canada Border Services Agency
CENTCOM	Central Command
CGT	Criminal geographical targeting
CSIS	Canadian Security Intelligence Service
DEA	Drug Enforcement Administration
EU	European Union
FBI	Federal Bureau of Investigation
FLQ	Front de libération du Québec
GIS	Geographic Information System
ICIAF	International Criminal Investigative Analysis Fellowship
JTC	Journey to crime
LAO	Legislative Analyst's Office
LTTE	Liberation Tigers of Tamil Eelam
MnSOST-R	Minnesota Sexual Offender Screening Tool - Revised
MSP	Maryland State Police
NCAVC	National Center for the Analysis of Violent Crime
OPP	Ontario Provincial Police
PCL-R	Hare Psychopathy Checklist – Revised
PKK	Partiya Karkerên Kurdistan (Kurdistan Labour Party)
RCMP	Royal Canadian Mounted Police
RMC	Risk Matrix - Combined
RMS	Risk Matrix - Sexual
RMV	Risk Matrix - Violent
RRASOR	Rapid Risk Assessment for Sex Offence Recidivism
SCAN	Scientific Content Analysis
SORAG	Sex Offender Risk Assessment Guide
SVR-20	Sexual Violence Risk - 20
US	United States
USMC	United States Marine Corps
ViCAP	Violent Criminal Apprehension Program
ViCLAS	Violent Crime Linkage Analysis System
VRAG	Violence Risk Appraisal Guide

1. Introduction

Ever since the events of September 11, 2001, Canadians have become increasingly preoccupied with national security. The use of profiling and its potentially harmful repercussions on persons belonging to a minority group (Gabor, 2004; Wortley and Tanner, 2003, 2005) and its real contribution to the maintenance of public security is currently under debate. However, profiling is a police tactic that has existed since well before the events of September 11, including its use in connection with anti-drug trafficking and the prediction of traits and characteristics of various types of criminals, as is done during investigations. Despite the ethical questions that must necessarily arise around such a practice, several defenders of profiling still support its effectiveness (or at least its usefulness).

1.1 Summary of the issue

The context of this report is one where security agencies need tools to ensure national security, but there is some sensitivity with respect to the rights protected by the *Canadian Human Rights Act*. As Karpinski and Théroux (2008) noted in their report *The Dilemmas of Ensuring National Security while Protecting Human Rights: the point of view of the Canadian Human Rights Commission,* the police, border service agencies and intelligence services struggle to exercise their responsibility to guarantee citizen security without becoming instigators of discrimination. Faced with the growing popularity of profiling, attributable in part to the image presented by the popular media, this report focuses on the question of the true effectiveness of the methods involved in this practice. Specifically, this report examines whether profiling constitutes a valid, effective means for the State to maintain national security.

The very definition of profiling raises issues, in terms of not only the current ethical debate, but also the empirical research on its usefulness and many functions. Firstly, its diverse, often divergent, connotations can often easily lead to confusion. More specifically, the term profiling is often used in a context that renders it analogous to discrimination. Authors who adopt this definition, such as Wortley and Tanner (2003; 2005), designate this practice as the act of targeting an individual because of his race or ethnic membership without other *reasonable* clues for suspecting an individual of a crime. However, most of the empirical literature on profiling approach this construct from a purely descriptive point of view of criminal investigation methods and instead designate the cataloguing of sociodemographic particularities as well as individual and psychological dispositions, personality traits, geographic location and the criminal and legal history of various types of criminals.

For practical reasons and to facilitate reader comprehension, it is important to clarify here that in this report we are interested in the second type of profiling. We stress the importance of a precise definition in terms of the objectives of this work because it is also necessary to clarify what this report does not aim to do, which is to evaluate the harmful psychosocial effects of engaging in such a practice. We recognize, however, that it is difficult to prepare such a study without any reference to the issues arising from this practice for the individuals targeted.

Although profiling seems to have suddenly become a more widespread phenomenon, the influence of the media on popular (and often erroneous) perceptions remains insidious. In fact, the images conveyed by various police series as well as the public attention aroused by certain individuals promoting themselves as profilers provides a sometimes idealized image of the actual role assumed by an "authentic" profiler in a criminal investigation. The resulting popular image of a profiler is a quasi-mythical being with special abilities and intuition that always help him to successfully target wanted criminals.

Two important limits on research into North American profiling should be mentioned for the purposes of this report. On one hand, the number of profilers currently working in Canada is very limited, which does not facilitate the task of conducting and publishing empirical studies on the effectiveness of this practice. Such studies would be a most important complement to the work presented here. On the other hand, the majority of the existing empirical studies on the effectiveness of profiling should be interpreted with caution, given the fact that 1) authentic profilers rarely participate in studies and expose their methods and abilities (Turvey, 1999) and 2) determining exactly which individuals claim to be profilers in research situations would be an arduous task since, in several countries, profiling is not yet a regulated profession, so anyone could legally call himself a profiler (this is not the case in Canada, however). In addition, the practice of profiling, like the criteria for becoming a profiler, can vary significantly from one country to another. Unfortunately, self-proclaimed profilers are especially likely to participate in published studies. This type of profiler rarely has formal training in the field. Consequently, the credibility of the profilers who took part in the majority of the research remains highly variable.

1.2 Objective

The purpose of this report is to evaluate the effectiveness of various types of profiling as identified in empirical literature on the subject. More precisely, the aim of this project is to evaluate, with the help of a critical review of the literature, whether various profiling methods are sufficiently developed and sophisticated to justify their application to national security. Finally, the results of this research, as well as the conclusions drawn from this evaluation, will be used to make recommendations for the Canadian Human Rights Commission with respect to what consideration this method of investigation should be given.

1.3 Plan

This report will cover the empirical effectiveness of profiling as observed in various researched and applied contexts. The report will begin with an introduction to the methodological framework and research criteria used to evaluate the effectiveness of profiling. This will be followed by a presentation of the results of empirical research into the effectiveness of behavioural and geographic profiling as well as its admissibility in court. The next section, which will focus specifically on the preventive aspect of profiling, deals more specifically with its applications in the fight against terrorism, drug trafficking, school shootings and the prevention of recidivism in incarcerated individuals. Decision-making in situations of uncertainty, notably cognitive bias and

heuristic decisions manifested when a person is compelled to make a decision in matters of security based on limited, insufficient or ambiguous information, will be covered in the sixth section of the report. Finally, conclusions drawn from empirical results and limits inherent to the research published to date on the subject of profiling will be presented in the final section.

2. Methodological framework

2.1 Research sources and criteria

The three main methods used to identify documents covered were: 1) computerized data banks and documentary research engines, 2) the "snowball" method, which involved consulting previously obtained text references, and 3) various field experts' recommendations.

The data banks and research engines consulted included Cambridge Journals Online, Cambridge Scientific Abstracts, Canadian Research Index, ERIC, FRANCIS, Google Scholar, JSTOR, ProQuest, PsycARTICLES, PsycInfo, Research Library, Sage Journals Online and Science Direct.

Thirteen organizations were contacted for their profiling expertise. By the report deadline, four of these organizations had accepted our request for collaboration, while two had declined. No response was received from the other organizations.

We must also acknowledge the exceptional collaboration of the Ontario Provincial Police (Angela Eke, Kathryn J. Lines and Jim Van Allen), the International Criminal Investigative Analysis Fellowship (Glenn Woods) and the Belgian Federal Police (Françoise Godefroid).

Organizations Contacted and Their Response, October 31, 2008

Organization	Country	Response
Bundeskriminalamt	Germany	None
Canada Border Service Agency	Canada	Negative
Drug Enforcement Administration	United States	None
Federal Bureau of Investigation	United States	Negative
Royal Canadian Mounted Police	Canada	Positive
Home Office	England	None
International Criminal Investigative Analysis Fellowship	International	Positive
MI5	England	None
Belgian Federal Police	Belgium	Positive
Ontario Provincial Police	Canada	Positive
Polizia di Stato	Italy	None
Sûreté du Québec	Canada	None
U.S. Customs and Border Protection	United States	None

The following subsections will describe our research criteria and classify the 277 documents obtained.

2.1.1 Document origin

Texts originated from a range of disciplines, primarily criminology (200), psychology (70) and law (42). Documents from the field of education dealt specifically with the phenomenon of school shootings.

Document Origin[1]

Discipline	n
Criminology	200
Psychology	70
Law	42
Sociology	23
Political science	10
Education	12
Economics	7
Psychiatry	4
Computer Science	2

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[1] Some of the documents fall under more than one discipline.

2.1.2 Year of document publication

Year of Document Publication
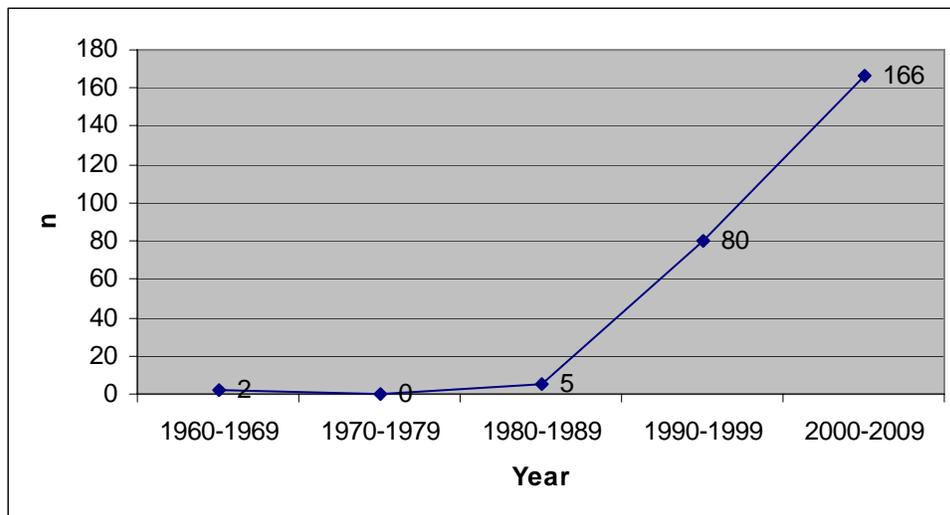
Documents consulted covered a period from 1965 to 2008. The scientific community's interest in profiling has continued to soar since the early nineties. The volume of publications obtained grew from five between 1980 and 1989 to 188 between 2000 and 2009.

2.1.3 Type of document

Various types of documents were consulted; most were scientific articles in refereed journals (196). This type of publication, as well as reports submitted to various governmental organizations, constituted the most relevant and, generally, most credible data sources.

Types of Documents

Type	n
Scientific articles	196
Books or chapters of books	30
Court decisions	16
Non-scientific articles	15
Reports	14
Correspondence	3
Working papers	1
Research digests	1
Brochure	1

2.1.4 Language of publication

The research study team consulted 262 English-language and 15 French-language documents. (Documents available in both languages were accounted for in the language in which they were read.)

2.2 Keywords

Document research involved the use of computerized data banks and document search engines such as *Google Scholar*, *PsycInfo, Science Direct* and so on. The key words used in the searches included *behavioural profiling*, *crime mapping*, *crime pattern*, *crime scene profiling*, *criminal assessment*, *criminal profiling*, *distance decay*, *ethnic profiling*, *geographic profiling*, *investigative psychology*, *offender profiling*, *personality profiling*, *profiles*, *profiling*, *prospective profiling, psychological profiling*, *racial profiling*, *recidivism*, *repeat offending*, *school shootings* and *terrorist profiling*.

2.3 Document classification

2.3.1 Subject treatment

Documents were initially classified based on their treatment of the subject of profiling. Empirical treatment, which assumes the gathering and analysis of data, was the treatment preferred for evaluating the effectiveness of profiling (144 texts).

Subject Treatment

Treatment	n
Empirical	144
Theoretical	58
Commentary/essay	41
Compilation of research	25
Court decision	17
Reference manuals	9

2.3.2 Approach

The documents were then classified based on their approach to the subject. The most frequent empirical approach was the quantitative approach (93).

Subject Approaches[2]

Approach	n
Quantitative empirical	93
Case study	44
Qualitative empirical	25
Demographic analysis	23
Actuarial	23
Mathematical simulation	15
Traffic control analyses	12
Probabilistic	10

2.3.3 Country

The documents consulted covered profiling experiences in ten countries over four continents: North America (Canada and the United States), Europe (Belgium, Finland, France, the United Kingdom and Sweden), Asia (South Korea and Japan) and Oceania (Australia).

2.3.4 Profiling criteria

Of the texts consulted, 198 dealt with behavioural profiling, 127 were based on sociodemographic criteria (including racial profiling) and 49 dealt with geographic profiling. More than one type of profiling criteria may be covered in the same text.

2.3.5 Type of intervention targeted

Type of Intervention Targeted[3]

Intervention	n
Criminal arrest	101
Prevention (without credible information)	92
Assessment of an individual's dangerousness	38
Prevention (crime information)	27
Prevention (crime and suspect information)	22
Instruction (court testimony)	19

The type of action targeted by profiling may be divided into six categories: 1) criminal arrest, 2) crime prevention without credible information, 3) crime prevention with credible information on the potential crime, 4) crime prevention with information on the crime and the potential

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[2] More than one approach may be used in the same document.
[3] More than one type of intervention may be used in the same document.

criminals, 5) assessment of an offender's dangerousness or recidivism risk, and 6) expert testimony during the trial phase.

2.4 Analysis criteria

The analysis of documents gathered, particularly empirical research findings, was based on two criteria: level, and strength of evidence. Studies with major deficiencies in methodology that undermined credibility were systematically eliminated.

2.4.1 Level of evidence

Level of evidence is the first criterion used to judge the methodology proposed by the analyzed study. Documents were classified on the basis of three levels of evidence:

1. Theoretical: the document does not cover the effectiveness of profiling directly –it may not even cover profiling directly – but it empirically covers the links between crime scenes, criminal behaviour, personality traits and so on. These links contribute to the establishment of theoretical bases suggesting the possible or probable effectiveness of profiling. Salfati's work is an example that belongs in this category;
2. Restricted empirical: the document deals directly with the effectiveness of profiling but in an artificial, laboratory context. The study of profiling outside its natural context of use allows at best for support of possible or probable empirical effectiveness. Most of the empirical articles on profiling, including Kocsis' work, belong in this category (when they are sufficiently solid in methodological terms);
3. Broad empirical: the document is a direct study of the effectiveness of profiling in an authentic situation; that is, the analyzed data comes from the practice of real profiling by police. Copson's study (1995) is one of the rare examples of this type of text.

2.4.2 Strength of evidence

Strength of evidence describes the magnitude of support provided by the results of research in favour of the hypothesis that profiling is effective. Here again, documents deemed sufficiently credible were classified on the basis of three hierarchical levels:

1. No support: the results are credible and suggest that profiling does not constitute an effective method of investigation or prevention. This is especially the case for studies on racial profiling;
2. Possible support: the results are credible but do not satisfy all the scientific criteria to establish a causal relationship between the use of profiling and an improvement in the results of police investigations or crime prevention. Nevertheless, the effectiveness of profiling remains one of the hypotheses that could explain the results;
3. Strong support: the results are credible and meet the scientific criteria to establish a reasonable cause-and-effect relationship between profiling and the success of

investigations and crime prevention. In this case, there is no doubt as to the effectiveness of profiling.

3. Behavioural profiling

3.1 Background and definition

Several authors (e.g. Ainsworth, 2001) have pointed out the public's general misconception of the work of profilers. This misconception is supported partly by various television series that give profiling a mythical aura. Even within the rather small circle of profilers there are two main schools of thought: one that considers criminal profiling an art, and the other that considers it a science. Those in the first group place more emphasis on their skills and intuition and maintain that few people have the essential qualifications (Agrapart-Delmas, 2001). Those who consider criminal profiling a science believe, on the contrary, that any person with access to adequate techniques can help conduct a successful investigation (Ainsworth, 2001). Hicks and Sales (2006) mention, however, that most profilers are not prepared to reveal their methods, for fear of being criticized or copied.

The very idea of profiling came about from works of fiction. The first "profiler" reviewed is Dupin in Edgar Allan Poe's *The Murders in the Rue Morgue*, published in 1814. The first case of profiling in a real investigation is the analysis voluntarily provided by Thomas Bond, who participated in the autopsy of Mary Jane Kelly in the case of Jack the Ripper in England in 1888. Since the criminal was never identified, the accuracy of the profile cannot be evaluated. More recently, the U.S. army called on psychoanalyst Walter Langer to trace a psychological profile of Hitler in 1943. This profile had correctly predicted, among other things, that Hitler preferred suicide to being captured. Personality tests were also administered to American soldiers, but the results of this research remain secret (Hicks and Sales, 2006).

The first request for profiling expertise by law enforcement agencies dates back to 1956 when New York psychiatrist James A. Brussels was called on to provide a profile of the Mad Bomber (George Metesky). The profile provided by Brussels, which proved to be impressively accurate (down to the clothing worn by the suspect at the time of his arrest), contributed largely to the subsequent popularity of this approach. The FBI began to incorporate profiling into its investigation practices in the early sixties, although the Behavioural Analysis Unit was not founded at Quantico until 1978 (Egger, 1999). In England, interest in profiling soared in the mid eighties, viewed from a psychoanalytical and clinical psychological perspective, after David Canter contributed to the investigation leading to the arrest of the "Railway Rapists," John Duffy and David Mulcahy (Hicks and Sales, 2006; McGrath, 2000). It was following this experience that Canter decided to establish the first university program in investigative psychology at the University of Liverpool in 1994 (Egger, 1999).

Despite the internal disagreements especially relating to profiling methods, it is generally agreed that [TRANSLATION] "criminal profiling may be defined as a technique promoting the identification of a suspect's principal characteristics of personality and behaviour, based on the elements of the crime he has committed" (Beauregard and Proulx, 2001, p. 20). According to the

authors, criminal profiling may also be called psychological profiling, personality profiling, criminal investigative analysis (FBI/ ICIAF) or investigative psychology (D. Canter) (Copson, 1995). Although this definition is based primarily on criminal profiling activities, the methods and approaches used are highly variable and include, broadly speaking, analysis based on experience and intuition, the clinical approach and the statistical or actuarial approach (Snook, Eastwood, Gendreau, Goggin and Cullen, 2007).

3.2 The practice of behavioural profiling

In Canada, behavioural analysis units perform the following duties: develop profiles of unidentified offenders, analyze crime scenes, reconstruct crime scenes, conduct indirect personality assessments, provide advice on investigations or questioning, assist in the execution of search warrants, analyze statements or testimony, analyze suspicious deaths, conduct threat assessments and present services offered (Lines, 2008).

3.2.1 Who are the profilers?

In its beginnings—and still today in certain countries—there was very little oversight of criminal profiling. Copson (1995) pointed out that in England:

> There is no governing body for the regulation of professional or ethical standards in offender profiling. Notwithstanding several postgraduate psychology courses which incorporate some study of it, there is no academic qualification for offender profiling, and there is very little academic literature which deals directly with either the principles or the validity of offender profiling (p. 1).

Traditionally, anyone could call himself a profiler. Consequently, this discipline was practised by "experts" from a range of disciplines (psychiatry, psychology, psychoanalysis, criminology, policing and so on), with or without criminal investigation experience. In North America, however, profilers employed by major police organizations (FBI, RCMP, OPP) are not recruited from among the self-proclaimed experts.

The training of profilers in North America was initially under the responsibility of the FBI Police Fellowship Program. Following the closure of this program, however, the International Criminal Investigative Analysis Fellowship (ICIAF) was created in 1992 and took on the responsibility of providing rigorous, standardized training for profilers, then called criminal investigative analysts (ICIAF, 2005).

Under ICIAF direction, not everyone can become an analyst. In order to apply for the training program, a candidate must meet the following requirements:

- Be a police officer in good standing;
- Possess a minimum three years' recent experience in the investigation of interpersonal violent crime;

- Possess superior investigation skills, documented in writing, in the area of interpersonal violence;
- Possess a demonstrated ability to articulate thoughts both orally and in writing;
- Speak, write, understand and read English fluently;
- Be approved and sponsored by an ICIAF member in good standing;
- Be recommended in writing by the appropriate official of the agency employing the candidate;
- The agency employing the candidate must agree to cover all training costs;
- The agency employing the candidate must confirm in writing that the candidate will work primarily as an analyst for at least the final year of the training program and three years thereafter.

Once admitted to the roughly two-year program, the candidate must study or obtain training in the following areas: sex offenders and typologies, sexual homicide, legal pathology, crime scene reconstruction, homicide investigation, investigation into suspicious death, child abduction and abuse, interviews and interrogations, normal and abnormal behaviour (psychiatry and psychology), preparation of analyses, threat assessment, arson and attempted bombings, as well as a professional development course for instructors. The candidate must also familiarize himself with media and public relations strategies, blood spatter analysis, computerized case association systems (ViCAP, ViCLAS), laboratory procedures for criminal analysis and scientific content analysis (SCAN) (ICIAF, 2005).

The candidate must also complete a minimum of six months of investigation work supervised by a member of the ICIAF or the FBI National Center for the Analysis of Violent Crimes (NCAVC), including at least two months of supervised work at NCAVC. At the end of the training, the candidate must pass an examination. The candidate is presented with a case and has thirty days to write up an analysis and prepare an oral defence before the members of an evaluation committee, whose decision must be unanimous. After one year as an associate member in good standing, an application for full fellow status may be submitted to the ICIAF (ICIAF, 2005). Canada currently has four analysts who are full fellows: two employed by the RCMP and two by the Ontario Provincial Police (OPP). Three candidates are currently registered in the training program (two employed by the OPP and one by the RCMP). The Sûreté du Québec employs two analysts, but their status is unknown.

3.2.2 The practice of behavioural profiling

Profiling is used most often in cases where police have few clues that could help solve a case and are not certain what type of person committed the crime. Thus, profiling has been used especially in rape and homicide investigations, particularly with serial crime (Ainsworth, 2001). Profiling would also be particularly indicated in serial crime, ritual crime and particular forms of psychopathological crime (Beauregard and Proulx, 2001). However, the goal of profiling is not to directly identify the person responsible for the crime, but rather to predict the most probable characteristics of the criminal (Douglas, Burgess, Burgess and Ressler, 2006). The practice of profiling is based on certain assumptions: 1) human behaviour is predictable (Latour, Van Allen, Lépine and Nezan, 2007), 2) offenders are consistent in the way they commit their crimes and may be distinguished from other offenders, and 3) the way they commit their crimes is related to

their personal characteristics (Goodwill and Alison, 2007). However, certain social psychologists maintain that personality is not an effective predictor of action (Rossmo, 2000) and that the situational context must be taken into account (Bénézech and the Groupe d'Analyse Comportementale de la Gendarmerie Nationale Française [Behavioural Analysis Group of the French National Police], 2007; Homant and Kennedy, 1998).

Profile development is a demanding probabilistic operation requiring the availability of a vast amount of information (Geberth, 1996). In return, a correctly constructed profile can offer a variety of clues concerning, in particular, the criminal's age, race, sex, socio-economic status, residence, means of transport, level of education, marital status, occupation, criminal and psychiatric history, social and sexual development, military background, physical characteristics, habits, level of organization, pre- and post-crime behaviour and the potential for accomplices (O'Toole, 1999).

As a general rule, when investigators are faced with a crime scene, they will look for three clues: the *modus operandi*, a signature, and whether or not there is any staging. *Modus operandi* refers to a set of learned behaviours developed and repeated by the offender in criminal activities because these behaviours proved fruitful in crime. This concept is dynamic and malleable and will evolve according to the offender's experiences (Douglas, Burgess, Burgess and Kessler, 2006), although relative stability is observed for certain crimes, especially sex crimes (Sjöstedt, Långström, Sturidsson and Grann, 2004). The signature refers to criminal behaviours that go beyond the behaviour necessary to perpetrate a crime and will generally define the criminal's personality (Douglas *et al.*, 2006). Unlike the *modus operandi*, the signature will remain stable. The concept of staging is applied when the criminal wilfully alters the crime scene before the arrival of police. According to Douglas *et al.* (2006), there are two reasons for a person to use staging: in order to 1) distract the investigation from the most probable suspect, or 2) protect the victim or the victim's family. When the crime is staged, the person responsible is normally someone associated or related to the victim in some way. All these clues will be used to construct a portrait of the potential suspect while allowing investigators to verify whether the crime under investigation could be related to other, similar crimes.

Criminal profiling is currently used in three phases of the criminal justice process: the investigation, the arrest and the trial (Hicks and Sales, 2006). Profiling is used during the investigation phase when traditional methods have failed. At this stage, profiling is especially used to connect serial crimes and identify the physical, psychological and other characteristics related to the criminal's lifestyle. Profiling is also used during the investigation phase for the following reasons: to suggest certain pre- and post-crime behaviours the criminal is likely to exhibit; to evaluate the possibility that certain crimes evolve into more serious, violent crimes; and to suggest proactive tactics to encourage the criminal to reveal his identity. During the arrest phase, profiling is used to orient searches toward certain sectors or particular elements, to predict the criminal's behaviour upon his arrest, or even suggest interrogation techniques that are likely to lead to confessions. Finally, during the trial phase, profiling provides the court with expertise that makes it possible to connect various crimes to a single individual and to relate the crime or crimes in question to the individual's characteristics that were established in the development of the profile (Hicks and Sales, 2006). However, slip-ups observed in certain cases where profiling was used, as in the case of Guy Paul Morin in Canada (Kaufman, 1998) or Colin Stagg in

England (Marin, 2003), as well as the lack of science in the methods render the use of profiling during the investigation phase generally difficult (see section 3.6 on admissibility in court).

Little information is available concerning the use of profiling services. Copson (1995) points out that in England, from 1990 to 1994, police services (48 agencies represented out of a total of 56) used a profiler 184 times. The crimes for which profiling was used were homicides (113), rape (40), extortion (12), other sex crimes (10), arson (4), abduction (3) and threats (2). The services most frequently requested were profiling (116) and assistance with comprehension of the crime (112). Requests for profiling services appear to be on the rise in several countries (Copson, 1995; Snook, Eastwood, Gendreau, Goggin and Cullen, 2007), which leads Kocsis (2006) to wonder, "Possibly the greatest mystery surrounding criminal profiling has been its growth despite an absence of robust scientific evidence to validate it" (p. 458).

In Canada, three agencies have a section dedicated to criminal profiling: the RCMP's Special Services and Behavioural Sciences Branch, the Sûreté du Québec's Behavioural Analysis Service, and the Ontario Provincial Police Behavioural Sciences Section (Marin, 2003). Criminal profiling services have been offered by the OPP free of charge to police forces in Canada since 1991. Since that time, the Behavioural Sciences Section has dealt with about 3,150 requests for service, while the RCMP responded to approximately 175 requests annually. Of these requests, about 15% were specific requests for a profile of the perpetrator of a crime. For example, in 1996, the OPP received 18 requests for behavioural profiling. In 1997, that figure rose to 33, and to 35 in 1998 (Van Allen, 2008). The services of these agencies were particularly required in cases of homicides, rape, sexual assault and child abuse (Lines, 2008).

3.2.3 International use of profiling

In 2006, the Groupe de travail sur le traitement des crimes [Crime Treatment Working Group] prepared a portrait of the various approaches to profiling for a few European countries as well as the United States and Canada. We noted marked differences among the countries.

In the United States, criminal profiling is widely used at the federal level as well as in several states. However, it is reserved for the most serious crimes to facilitate the identification of the perpetrator or perpetrators. Because of the growing number of serial killers since the 1970s, the FBI decided to implement a specific information processing system for murders committed anywhere in the U.S. (Marin, 2003), which led to the implementation of the Violent Criminal Apprehension Program (ViCAP). This system compiles the specific characteristics of all the murders committed throughout the United States and has contributed to the arrest of several serial killers (Marin, 2003). The FBI also has a behavioural analysis service, the National Center for the Analysis of Violent Crime (NCVAC), specialized in the study of criminal behaviour available to all American investigators. The Center comprises four services: (1) the Behavioral Analysis Unit-1 (terrorism and threat analysis), (2) the Behavioral Analysis Unit-2 (crimes against adults), (3) the Behavioral Analysis Unit-3 (crimes against children), and (4) the Violent Criminal Apprehension Program (ViCAP). It should be noted that the FBI's notion of profiling focuses on the deductive method based on the analysis of crime scenes, psychological analysis and the analysis of behavioural evidence provided by the investigation. In addition, in the U.S. as in

Canada, geographic profiling is used to assist investigators in targeting a criminal's preferred geographic area (National Center for the Analysis of Violent Crime, 2008). Marin (2003) points out that the small size of many European countries may explain why geographic profiling is seldom, if ever, used.

In Great Britain, investigators often use behavioural psychologists who attempt to establish a victim as well as a suspect profile. A criminal's psychological profile is most often developed by several profilers who are experts accredited by the Behavioural Sciences subcommittee (police officers' association). According to Marin (2003), it seems that in the particular case of England the police services are quite circumspect as to the usefulness of profiling. Moreover, Marin (2003) points out that some criticism has arisen in England against the potential abuse of profiling. The author cites the case of Collin Stagg, linked to the murder of Rachell Nickell.

In Belgium, profiling was introduced in 1996, but really gained popularity in 2001 when the Federal Judicial Police created the Behavioural Science Service (GWSC), which had a staff of 15 in 2008, including four behavioural analysts. The analysts are responsible for profile analysis, hearing support (interrogation), threat assessment, research, and training. In 2007, the service provided support in 133 cases, including 17 profile analyses in 62 cases (Godefroid, 2008).

In 2003, Switzerland adopted the ViCLAS system, which consists of a data bank that collects psychological prints and then prepares psychological profiles of murderers and attackers.

In the Netherlands, Spain, Germany, Italy and the Czech Republic, criminal profiling seems less developed (Serial Crime Working Group, 2006). In the Netherlands, profiling does not exist as such, although certain information related to criminals is gathered and analyzed, notably because of the ViCLAS program. In Spain, it seems that profiling has not extended beyond the confines of universities and symposia, even though Marin (2003) notes several data banks that draw connections in criminal investigations. In Germany, some profiling is done by police departments that develop behavioural profiles with the help of joint teams of police officers and psychologists. However, Germany's federal structure makes it difficult to quantify the success rate of profiling in that country (Marin, 2003). In Italy, the behavioural analysis service created by the Ministry of the Interior in the forensics unit (Violent Crime Analysis Unit) includes a team of police officers, psychologists and anthropologists who assist in analyzing crime scenes, extrapolating repetitions, developing typical victim profiles and defining the behavioural elements that could help in the search for the criminal. The Czech experience in the field of profiling still seems limited. However, according to Marin (2003), it appears that the Canadian ViCLAS system is gradually being implemented. Its field of application must cover voluntary homicides, assassinations and gross indecency. Loading the database involves 1,000 old cases and an annual volume of 700 cases. There seems to be little information on the profiling methods used in countries other than those mentioned in this section.

3.3 Theoretical framework

Crimes subject to profiling are normally part of a series of similar crimes (Cook and Hinman, 1999). In order to produce a reasonably accurate offender profile, investigators gather clues from

the crime scene. According to O'Toole (1999), several behavioural characteristics may be extracted from where the crime took place: 1) the degree of planning involved, 2) the degree of control used by the offender, 3) the escalation of emotions at the crime scene, 4) the level of threat to the victim and the offender and 5) the appearance of the crime scene (organized vs. disorganized). In fact, the premise of profiling is that the more investigators know about the victim, the more they will know about the offender (O'Toole, 1999).

There are several models and typologies for the practice of profiling. Homicide and rape are the crimes most often analyzed, and most of the models are derived from analyses of these crimes. Moreover, "The models […] are labelled *non-scientific* because, although they may refer to scientific principles to varying degrees, each model relies implicitly or explicitly on an artful component to complete an offender profile" (Hicks and Sales 2006, p. 17). The following sections present the best-known typologies, classified according to the crimes profiled.

3.3.1 Homicides

3.3.1.1 Douglas, Ressler, Burgess and Hartman typology

This first model, which originated in the FBI, makes a distinction between organized and disorganized crime scenes. According to Davis (1999), an organized crime scene indicates planning, premeditation and a conscious effort on the part of the criminal to avoid being caught. A disorganized crime scene indicates spontaneous action and a generally violent assault. The victim is usually chosen at random and the location of the crime is generally the place where the victim and offender met (Davis, 1999). Although several crime scenes may involve both types, the offender classification will be based on the level of organization or disorganization considered predominant at the crime scene. On the basis of this classification, several conclusions have been drawn with respect to the characteristics of the individual (level of intelligence, employment, social adjustment, etc.) (McGrath, 2000).

3.3.1.2 Fesbach's Typology

A second model, described by Salfati (2000; Salfati and Canter, 1999; Salfati and Park, 2007) but inspired by Fesbach, is based on the function that the homicide serves for the offender. The model distinguishes two types of aggression, expressive and instrumental, characterized by the goals or rewards they offer the offender. Expressive aggression occurs in response to anger provoked by insult, personal attack, humiliation or failure. The goal of this aggression is to punish the victim and make him suffer. The instrumental function comes from a desire for possession or status, such as, for example, to obtain jewellery, money, territory or power. For the instrumental offender, murder is not an end in itself, but may occur if someone comes between him and the achievement of his goal. Attempts to link this typology to elements of crime scenes and personality traits of the offender involve significant methodological weaknesses (e.g. Salfati and Canter, 1999; Salfati and Park, 2007).

3.3.1.3 Typology of Holmes and Holmes

Holmes and Holmes propose a serial killer typology with four categories based on what motivates the individual: visionary, missionary, lust killer and power seeker (Hicks and Sales, 2006).

3.3.2 Sex crimes

3.3.2.1 Typology of Keppel and Walter

An initial typology for sexual homicide comes from an existing typology for rape (Keppel and Walter, 1999). This typology describes the crime according to its function for the offender. Four types of functions may be advanced to describe rape and rape followed by homicide, namely power-assertive, power-reassurance, anger-retaliatory and anger-excitation. The power-assertive offender commits a crime of power where the rape was planned but murder is an unplanned response to an escalation of violence in order to control the victim. The *power-reassurance* offender also engages in a planned rape in which homicide was not planned. In this type of crime, the offender attempts to demonstrate his sexual competence through seduction. However, when the victim does not cooperate in the offender's scenarios and fantasies, a feeling of failure and panic pushes the offender to commit the murder. In the case of the *anger-retaliatory* offender, the rape and homicide are planned. In this type of crime, motivated by anger, the offender tries to avenge himself of a person by attacking a symbolic victim. Finally, for the *anger-excitation* offender, the goal of the planned rape and homicide is gratification by infliction of pain and terror on the victim. Prolonged torture of the victim will feed the offender's fantasies and temporarily satisfy his need for domination and control (Keppel and Walter, 1999).

3.3.2.2 Typology of Hazelwood and Warren

This typology comes from Hazelwood and Warren (2000) and describes the offender as impulsive or ritualistic in his actions. According to the authors, the impulsive offender is a common type of sexual offender who generally has little success avoiding identification and apprehension. In fact, this type of criminal acts impulsively, takes little or no action to protect his identity and is apparently unaware of the risks associated with committing a crime. The ritualistic offender is much less common, and unlike the impulsive offender, he is much more successful in his actions and becomes very difficult to identify and apprehend. This type of criminal devotes considerable time and effort to planning and repeating his criminal actions. The validity of this typology has notably received the support of the study by Warren, Reboussin, Hazelwood and Wright (1991).

3.3.2.3 Typology of Beauregard and Rossmo

In a series of articles, Beauregard and Rossmo (Beauregard, Proulx, Rossmo, Leclerc and Allaire, 2007; Beauregard and Rossmo, 2007; Beauregard, Rossmo and Proulx, 2007) attempted to elucidate the hunting scenarios of serial sex offenders. These scenarios were based on four hunting patterns and three attack methods:

- Hunting patterns:

1. *Hunter*: specifically looks for victims from his place of residence;
2. *Poacher*: specifically looks for victims based on an area of activity other than his place of residence or travels to another city during the search process;
3. *Troller*: meets a victim in an opportunistic manner while taking part in non-predatory activities;
4. *Trapper*: has a certain position or occupation or creates a situation that allows him to meet potential victims in the area he is covering as part of this occupation.

- Attack methods:
  1. *Raptor*: attacks a victim upon encounter;
  2. *Stalker*: first follows a victim upon encounter and then attacks her;
  3. *Ambusher*: attacks a victim only after she has been enticed to a location controlled by the offender.

Empirical studies based on this typology have made it possible to identify three scenarios with a total of five variations, based on the observed combinations of hunting patterns and attack methods (Beauregard, Proulx, Rossmo, Leclerc and Allaire, 2007; Beauregard and Rossmo, 2007; Beauregard, Rossmo and Proulx, 2007):

1. Coercive scenario
    1.1 Intrusive
    1.2 Outdoor
2. Manipulative scenario
    2.1 With sophistication (trick)
    2.2 By infiltration
3. Non-persuasive scenario: direct action

3.3.2.4 Typology of Blanchette, St-Yves and Proulx

Blanchette, St-Yves and Proulx (2007) have proposed a typology for rapists and pedophiles. In both cases, there are three types: festive, organized and isolated. Their empirical research suggests the following characteristics:

Typology of a rapist

1. The festive rapist:
    -resembles an offender in general: antisocial;
    -interpersonal relationships marked by hostility, lack of empathy and immediate satisfaction of needs;
    -sensitive to influences extolling the domination of men over women;
    -regular contact with immediate family (87%), good hygiene (82%), single (82.2%), consumes alcohol regularly (82.6%) and has at least one close friend (95.7%);
    -consumes alcohol prior to the offence (78.3%), coercive approach to committing the offence (87%) and does not masturbate the victim (0%).

2. The orderly rapist:

-motor vehicle in excellent condition (85.7%), good hygiene (100%), lives with someone (87.5%), owns his own home (75%), owns a motor vehicle (87.5%), is not single (0%) and does not regularly frequent erotic bars (0%);
-does not consume pornographic material prior to committing the offence (0%), premeditation (87.5%), no anal penetration (0%), cunnilingus (0%) or masturbation of the victim (0%), coercive approach in committing the offence (87.5%), does not mutilate the victim (0%).

3. The isolated rapist:
- non-existent social life;
-does not frequent restaurants (0%), motor vehicle in excellent condition (75%), good hygiene (100%), does not own his own home (0%), does not frequent bars (0%), single (83.3%), has a job (83.3%), has at least one close friend (83.3%) ;
- does not consume pornographic material prior to committing the offence (0%), premeditation (83,3%), vaginal penetration (100%) but not anal (0%), asks for fellatio (83.3%), coercive approach (100%), no mutilation (0%), does not attack handicapped victims (0%), does not come from a poor or dysfunctional environment (0%), no deviant sexual fantasies prior to committing the offence (0%), forces the victim to perform sexual acts (83.3%) and genital touching (83,3%).

Typology of a pedophile

1. The festive pedophile:
- resembles a general offender: antisocial;
- regular contact with immediate family (85.2%), involved in sports (79%), good hygiene (82.8%), lives with someone (75.9%), regularly consumes alcohol (86.2%) and drugs (82.8%);
-member of the victim's family (75.9%).

2. The organized pedophile:
- regular contact with immediate family (88.2%), good hygiene (76.5%), lives with someone (88.2%), owns his own home (100%), owns a motor vehicle (100%);
- does not consume medication/solvents prior to committing the offence (0%), the victim is a close acquaintance (76.5%), member of the victim's family (88.2%), premeditation (94.1%), the victim is not under the effects of a drug or alcohol (0%).

3. The isolated pedophile
- non-existent social life;
- regular contact with immediate family (90.5%), single (90.9%);
- does not consume medication/solvents prior to committing the offence (0%), premeditation (90.9%).

3.3.2.5 Typology of Fortin and Roy

Fortin and Roy (2007) are interested in consumers and producers of child pornography on the Internet. They describe three types of users:

1.	recreational (satisfaction of sexual curiosity);
2. sexually compulsive (unconventional sexual behaviours: consumers of pornography, sexual relations with several partners, use of prostitutes' services, and so on);
3. the at-risk user (no previous history of compulsive sexuality, but online habits have a depressive or reactionary impact on his life).

These authors also identify four types of collectors:

1. Secret (secret, commercial sources, no previous history);
2. Isolated (sexual aggressor);
3. Family (seeks validation of his behaviour);
4. Commercial (profit seeker, also aggressor).

3.3.2.6 Typology of Holmes and Holmes

Holmes and Holmes essentially return to the typology of Keppel and Walter (1999), with a few nuances: 1) power reassurance, 2) anger retaliation, 3) anger exploitive and 4) sadistic (Hicks and Sales, 2006).

They also propose a typology for child molesters, which they divide into situational molesters (regressed pedophile; morally indiscriminate; sexually indiscriminate; or naive/inadequate) and preferential pedophiles (sadistic pedophile; seductive molester or fixated molester) (Hicks and Sales, 2006).

3.3.3 Arson

3.3.3.1 Typology of Rider

According to Rider, the arsonist may be motivated by jealousy, a need for recognition, a search for strong sensations, or compulsion (pyromania) (Hicks and Sales, 2006).

3.3.3.2 Typology of Douglas, Burgess, Burgess and Ressler

Douglas, Burgess, Burgess and Ressler (2006) present a range of motivations that is both broader and more precise than Rider: 1) revenge, 2) excitement (strong sensations, attention, recognition or sexual excitement), 3) vandalism, 4) concealment of a crime and 5) profit. Note that Holmes and Holmes also submit a typology of the arsonist that is in fact a collage of the characteristics identified by Rider and Douglas, Burgess, Burgess and Ressler (Hicks and Sales, 2006).

3.3.3.3 Typology of Fritzon, Canter and Wilton

The article by Fritzon, Canter and Wilton (2001) describes a classification system based on four models of action (expressive, integrative, conservative and adaptive). The adaptive mode refers to cases of vandalism where the person takes advantage of the opportunity present to commit his crime. The target is less important than the desire to change. The expressive mode refers to the

external manifestation of an internal process. This form of pyromania suggests that likely targets are those that will allow the individual to get attention (for example a hospital or a large building). The integrative mode refers to the act of setting fire to oneself or surrounding objects in what appears to be suicide. This act results from a state of personal distress and is directed toward himself. Finally, the conservative mode generally results from a need to avenge someone or something.

3.3.4 Terrorism

3.3.4.1 Hacker's typology

Hacker is the first to propose a typology for terrorism. He distinguishes three types: 1) the crusader, ideologically motivated and generally responsible for recruitment and planning; 2) the criminal, a violent individual seeking a pretext, who carries out his acts without becoming ideologically involved, and 3) the crazy, mentally vulnerable or disturbed, attracted by philosophical certainty (Miller, 2006).

3.3.4.2 Strentz's typology

Strentz's typology also includes three categories: 1) the leader, egocentric, paranoid and charismatic; 2) the activist, antisocial or psychopathic, sometimes a former inmate or mercenary, not truly engaged ideologically, and 3) the idealist, devoted to building a "better world," hopeless and dependent (Miller, 2006). This typology has certain similarities with Hacker's.

3.3.4.3 U.S. Secret Service typology

The U.S. Secret Service distinguishes between five types of terrorists: 1) the crusader, ideologically motivated by his political or religious convictions; 2) the ultraconservative political terrorist, who believes in individual rights in a regime seen as repressive, is active in a quasi-military organization that is ultraconservative, authoritarian and extremist; 3) the political anarchist is an ultra-left-wing activist who sees the government as racist, elitist and economically oppressive; 4) the religious terrorist, who does not answer to anyone except God and who kills in his name; and 5) the criminal terrorist who is more opportunist than idealist and acts for his own benefit (Miller, 2006).

3.3.4.4 Miller's typology

Finally, Miller (2006) proposes his own typology, which associates the type of terrorist with psychopathological characteristics: 1) the leader (narcissism and paranoia), 2) the believer (antisocial and borderline), 3) the soldier (avoidance and dependence), and 4) the public danger (histrionic and schizoid).

There are several other typologies and theoretical approaches, including Turco's psychoanalytical approach (based on borderline, narcissist disorders), Turvey's inductive approach and Canter's

psychodynamic model (Hicks and Sales, 2006). Levi-Minzi and Shields (2007), as well as Salfati, James and Ferguson (2008), have attempted to develop a profile of the serial prostitute killer.

3.4 Criticism of existing models

Hicks and Sales (2006) engaged in a systematic criticism of theoretical models intended to guide the practice of behavioural profiling. These authors pointed out the lack of standards and empirical studies aimed at evaluating the effectiveness, reliability, validity and usefulness of models and typologies. In addition, they note some confusion attributable to a terminology that is sometimes ambiguous and generally variable from one model to another. The models themselves combine general approaches to typologies and taxonomies that are sometimes intrinsically inconsistent or have significant category overlap. Finally, significant methodological shortcomings often cast doubt on the validity of the studies claiming to support these models.

It seems that, despite the claims of certain authors, notably Canter, these models cannot claim to be "scientific." In general, it is agreed that the current practice of profiling depends on the profiler's intuition and professional experience. The procedures for using these models, making decisions when faced with ambiguous data and developing profiles also remain somewhat inexplicit. Lastly, these approaches do not all culminate in observable characteristics that could assist investigators.

In short, Hicks and Sales (2006) point out that "None of the models has provided any evidence that profiling, as currently practised, has any substantial investigative value" (p. 65). Few models have any empirical support whatsoever.

3.5 Empirical support

It would seem relevant to point out from the beginning that it is [TRANSLATION] " … difficult to measure the effectiveness of criminal profiling in crime solving. Most of the time, the success of an investigation depends on all the factors as a whole" (Latour, Van Allen, Lépine and Nezan 2007, p. 529). In addition, as Hicks and Sales (2006) point out, "…because F.B.I. profilers are explicitly trained not to put profiles in writing, the extent to which profiles can be systematically or scientifically reviewed is also limited" (p. 121). Conducting rigorous empirical studies to support or refute the effectiveness of profiling would therefore pose a challenge.

3.5.1 General evaluations

One of the only large-scale studies directly related to the effectiveness of criminal profiling was conducted by Copson (1995) in England. However, this study is almost fifteen years old and was conducted when Canter founded his Investigative Psychology program in Liverpool. Copson first covered four previous studies. The FBI investigation conducted by Douglas in 1981 (unpublished) revealed that profiling would have helped target the investigation in 77% of the cases where the accused was identified and would have allowed identification in 15 cases (8%).

According to the FBI investigators, profiling would have saved a full-time investigator the equivalent of 594 days, and they unanimously supported maintaining the service.

In 1992, Britton conducted similar research in England for the Home Office (unpublished). Copson (1995) noted that, using the contribution of profiling to the arrest of suspects as a criterion for determining its effectiveness, "Judged on this stark criterion, and contrary to popular perception, little evidence was offered that profiles were either accurate or had contributed to any arrest" (p. 6). Nevertheless, profiling was deemed viable and has been continued in England.

The same year, a student (Goldblatt) wrote a thesis (unpublished) on David Canter's profiling program at Surrey University (precursor of the Liverpool program). Based on the information provided by Canter himself, out of 57 profiles, one suspect had been accused in "at least twelve cases," but it was difficult to judge the exact contribution of the profile. The analysis of twelve solved cases suggested that of 114 pieces of information included in the profiles, 72% were correct, 19% incorrect and 9% undetermined. Note that in both cases, the profile was produced *after* the suspect's arrest. Despite everything, the program was considered a success.

Finally, the Dutch Consumer Satisfaction Survey was conducted by Jackson and his colleagues in 1993 with the Scientific Research Advisory Unit in the Netherlands. This survey covered twenty cases over a two-year period. Although the opinion of the profilers constituted a formal profile in only six cases, the majority of the detectives considered it satisfactory. Copson (1995) concluded from an examination of these four investigations that "What each of the four previous studies has in common is that they all rely to a large extent on the opinions of detectives who have used offender profiling advice in live investigations. […] None of the four, however, can be regarded as definitive" (p. 7).

Copson then presented the results of his own investigation conducted in England, which involved 48 of 56 police forces in 184 profiling cases. He noted that although the profilers' opinions helped solve a criminal case in only 14.1% of the cases, 82.6% of the investigators stated that profiling proved operationally useful. According to the respondents, profiling led to the identification of the offender in only 2.7% of the cases, allowed for a better understanding of the crime or criminal in 60.9% cases, confirmed the investigator's judgment in 51.6% of the cases, and helped structure the interrogation in 5.4% of the cases. In 2.3% of the cases, profiling served other purposes and proved to be useless 17.4% of the time.

This research demonstrated that the main variable affecting investigators' perception of the usefulness of profiling was the identity of the profiler himself, which led Copson (1995) to state that, "It appears that, at this stage of the development of profiling in Britain, approaches to profiling are so idiosyncratic as to be indivisible from the identity of the profiler" (p. 29). In addition, it seems that few investigators acted directly on the advice of profilers. Given the small contribution of profiling to the identification of offenders, Copson (1995) concluded that it would not be of added value to conventional methods of investigation: "If […] profiling is to be judged valid on its own terms then its success ought to be based upon telling officers something of the type of person who has committed the offence under consideration, so that the conduct of the investigation –and its outcome- might be influenced by advice based on those inferences. The respondents in this survey perceive that profiling does not succeed on those terms" (p. 31).

More recently, Snook, Eastwood, Gendreau, Goggin and Cullen (2007) conducted a meta-analysis of empirical research on the effectiveness of profiling. Only four studies were analyzed, and although the profilers seemed to have done marginally better than other groups, the authors concluded that "The evidence generated from this research confirms the perceptions of those who have concluded that the criminal profiling field relies on weak standards of proof and that profilers do not decisively outperform other groups when predicting the characteristics of an unknown criminal." (p. 448) However, two important points must be made. First, the profilers involved in the analyzed studies were self-proclaimed profilers, in the sense that they did not necessarily have formal training in the field and were not members of the ICIAF. Next, the meta-analysis largely covered the work of Richard Kocsis and his team, work that was harshly criticized because of major methodological deficiencies.

Bennell, Jones, Taylor and Snook (2006) conducted an analysis of Kocsis' work and expressed a number of concerns, particularly with respect to the subjectivity of the measures used and the classification of several groups, including psychics, and one used as the control group. They noted no significant difference between the performance of the self-proclaimed profilers and the other groups of professionals as individuals. In addition, although Kocsis compared the accuracy of the profiles produced by various groups of individuals, he did not focus on the accuracy of the profile itself. Thus, although the profilers sometimes produced better results than comparison groups in a normative way, the absolute accuracy of the profile was often not very impressive. Finally, Bennell, Jones, Taylor and Snook (2006) pointed out the extremely small size of the profiler samples (three to eleven persons in all the studies combined), which made any statistical analysis doubtful, and the fact that the suggested task for evaluating profiler performance was not suitable for the profiling work performed by police. Kocsis (2006) responded to these criticisms, albeit not very convincingly.

3.5.2 Homicides

Kocsis, Middledorp and Try (2005) attempted to compare the capacities of various groups, including a group of five self-proclaimed profilers, to provide a file in a homicide case. The methodology used produced results with weak credibility. This article lends no serious support to the hypothesis that profiling is effective in homicide cases.

3.5.3 Sexual assault

In their study, Goodwill and Alison (2007) were interested in predicting the aggressor's age based on the victim's age in stranger rape. The relationship between the ages of the individuals involved appears to be influenced by the degree of planning and aggressiveness in the perpetration of the crime. They concluded that " …in cases where there is evidence of planning and offender over-aggressiveness the offender's age can be predicted by the victim's age within less than 3 years" (p. 833). However, where there is nothing to suggest that a process was used to select and target the victim and plan the crime, it would be extremely difficult to predict the age of the aggressor.

Certain researchers promote the use of databases and software that link previously documented criminals to new crime scenes based on relative similarities of the *modus operandi* or signature. Yokota, Fujita, Watanabe, Yoshimoto and Wachi (2007) applied similar software to the profiling of sex offenders in Japan. This approach directly identified the aggressor 24 out of 81 times, meaning that the aggressor was ranked as the first possible suspect 29.6% of the time. Overall, the offenders were ranked fourth on average. However, by limiting candidates to those residing in the prefect where the crime was committed, the success rate (offender ranked first) rose to 55.6%. This approach proved promising in cases where crimes were committed by repeat offenders and supports the hypothesis of a certain consistency in behaviour when an individual commits several crimes. The success of such method is, however, based on the size and quality of the database.

3.5.4 Arson

In one of his articles, Kocsis (2004) attempted to see whether there was any difference in profiling capacity among several groups for a series of arson incidents. However, the methodology was questionable and the results could not be considered credible. Overall, the results show that self-proclaimed profilers tended to have somewhat better results than non-practitioners of profiling, but these results were not significantly superior to a group taken individually, such as science students. Moreover, in addition to homicides, the study by Kocsis, Middledorp and Try (2005) also involved a profiling task in an arson case. The aforementioned concerns remain, and support for the effectiveness of profiling is also questionable in arson cases.

3.5.5 Burglary

Oatley, Ewart and Zeleznikow (2006) applied automated methods to a large profiling database for burglars based on crime scene characteristics. An initial approach, based on association rules, classification rules and decision trees, did not provide the anticipated results: "The data mining technologies of association rules and decision trees/classification rules did not produce operationally useful knowledge. The association rules we derived were of poor quality, either indicating no significant relationships or relationships that are too complex to determine using this method" (p. 73). However, by associating new crimes with spatiotemporal and behavioural data, the matching of crimes to criminals proved to be accurate 24% of the time. In 59% of the trials, the offender was among the ten most probable suspects identified by the software, 77% were among the 30 most probable and 94% were among the fifty most probable. These researchers also attempted to identify clues as to whether a crime scene would be revisited by the burglar within the same year. It seems that the research method, type of stolen property, method of entry and use of trickery would allow for this distinction, but the authors do not specify the success rate.

3.6 Admissibility in court

3.6.1 Admissibility criteria

The admissibility criteria for expert testimony in court, including those related to new scientific techniques or theories, have evolved since the early 20th century. These criteria are used as a guide for judges who must determine the admissibility of testimony referring to various aspects of criminal profiling.

In the United States, several states still rely on *Frye v. US* (1923), where the District Court of Columbia examined the admissibility of polygraph evidence. The court barred this evidence and ruled that:

> Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while the courts will go a long way in admitting experimental testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.

Thus, following *Frye*, the criterion for admissibility became acceptance of the technique or theory in question by the scientific community from the relevant discipline. However, there were several criticisms of this decision, such as that simple acceptance by the scientific community could not possibly constitute a sufficiently strict criterion (as the judge stated, it was already generally agreed that the earth was flat).

Since 1993, several U.S. states have adopted the standards set out by the U.S. Supreme Court in *Daubert v. Merrell Dow Pharmaceuticals* (1993), which supposes that:

1. The theory can be and has been tested;
2. The theory has been subjected to peer review;
3. The theory is reliable and its error rate is known;
4. The theory is generally accepted by the scientific community.

The publication of results in refereed reviews would provide some guarantee that the theory is not completely erroneous. If perfect reliability is not required, it is up to the court to judge the acceptable level. To do this, the probability of error for the proposed theory or technique must be known and presented in court.

In Canada, the admissibility of expert testimony depends on four criteria, established by the Supreme Court of Canada in *R. v. Mohan* (1994):

1. relevance (including the relationship between the case heard and scientific validity)

2. necessity (the testimony is necessary for the judge or jury to understand all the elements of evidence);
3. the absence of any exclusionary rule;
4. a properly qualified expert.

The Ontario Court of Appeal, in *R. v. Clark* (2004), adopted similar criteria:

1. necessity (the testimony goes beyond the normal scope of knowledge and experience of the average jury);
2. reliability (the testimony is anchored to the facts and is not limited to speculation);
3. The testimony is not immeasurably impressive (to prevent the jury from giving it more weight than is appropriate, which is liable to transform the trial by peers into a debate by experts).

The criteria of scientific validity mentioned in *Mohan* were specified following the Supreme Court of Canada ruling in *R. v. J.-L. J.* (2000), which refers to essentially the same standards as those adopted in the United States following *Daubert* (cf page 32).

3.6.2 Profiling before the courts

The variety of tasks accomplished by profilers has an impact on the type of evidence or testimony they are called upon to present in court. The courts' position seems to depend in part on the type of evidence brought forward.

Few testimonies related to profiling seem to have been admissible in Canada since *Mohan*. In general, a distinction should be made between two types of expertise: 1) crime scene analyses and 2) behavioural analyses.

Crime scene analyses

Crime scene analyses include inferences based on observation of the state of the crime scene and the victim. It is generally a matter of reconstructing the crime as it occurred and, sometimes, evaluating whether the crime scene was staged to launch the investigation on the wrong track.

In *R. v. Ranger* (2003), the Ontario Court of Appeal noted with respect to testimony that a crime scene had been staged:

> As noted by the Crown at trial, the fact that the crime scene may have been staged to look as if the house had been burglared (*sic.*) is a piece of circumstantial evidence that may provide some insight into the perpetrator's motivation and, in turn, his or her identity. No issue has been raised with respect to the relevance of this aspect of the expert evidence. Similarly, no real issue is raised with respect to the reliability of the evidence on this narrow point. The reliability of any opinion that a crime scene was staged would be very much a function of the particular witness's experience with scenes of break and enter (p. 14).

This point of view was also upheld by the Ontario Court of Appeal in *R. v. Clark* (2004), while reconstruction by a well-qualified expert and the demonstration that the crime scene had been staged (admitted as evidence in this particular case) were qualified as potentially admissible. This opinion is also shared in the U.S. (see notably *US v. Meeks*, 1992).

As a result of the development in the *Klymchuk* case (2005, 2008), there could be restrictions placed on the admissibility of this type of evidence in Canada. In 2005, the Ontario Court of Appeal decision based on both *Ranger* and *Clark* mentions the "established reliability" of the evidence based on the observation and reconstruction of crime scenes. However, since the court decided that the expert testimony had gone far beyond this area, it had been declared inadmissible. In 2008, the Ontario Superior Court ruled that another expert's testimony regarding the fact that the crime scene had been staged was inadmissible, based on two arguments: 1) the expert presented by the Crown had participated in the original investigation and developed a profile of the person who had committed the crime; the conclusion was that it would be impossible for him to detach himself entirely from this mode of reasoning if he limited himself to the observations made on the crime scene to support his testimony, and 2) he failed to convince the court that the criteria of necessity stated in *Clark* was achieved. For the court, the description of the crime scene and its comparison with normal burglary could have been done by the police officers who led the investigation, and this would have been sufficient for the jury to draw the necessary conclusions. In other words, the knowledge required to understand the facts presented as evidence did not go beyond the normal scope of the average jury, and consequently, expert testimony was not necessary.

3.6.2.2 Behavioural analyses

The objective of crime scene analysis as proposed by Ormerod (1996) is to determine what happened (the "what"), while behavioural analysis, or what the courts consider criminal profiling, attempts to identify the motive for the crime (the "why") or trace a profile of the person likely to have committed it (the "who") –or not to have committed it, according to the rule of exception stated in *Mohan* (who stipulates that where a crime or its perpetrator has particularly distinctive characteristics, an expert can testify that the accused does not have these characteristics). Behavioural analysis includes the attribution of certain crimes to the same person based on an examination of the elements of the crime constituting the criminal's *modus operandi* or signature (linkage analysis).

To our knowledge, this type of testimony has always been considered inadmissible in Canada, as the Ontario Court of Appeal explained in *Ranger*:

> …attempts to adduce expert opinion evidence about WHY an offence was committed in a particular manner and, more particularly, about WHO is more likely to have committed the offence, that is, the kinds of evidence that I have labelled more particularly as criminal profiling, have generally not met with success, either in this jurisdiction or elsewhere (p. 19).

Such testimonies have been considered inadmissible by the Supreme Court of Canada (in *Mohan* and *J.-L. J.*), the Ontario Court of Appeal (in *Ranger*, *Clark* and *Klymchuk*), the Ontario Superior

Court (in *Klymchuk*) and the Quebec Superior Court (in *R. v. Croteau*, 2004). In *Ranger*, the Ontario Court of Appeal explained that:

> Criminal profiling is a novel field of scientific evidence, the reliability of which was not demonstrated at trial. To the contrary, it would appear from [the expert's] limited testimony about the available verification of opinions in her field or work that her opinions amounted to no more than educated guesses. As such, her criminal profiling evidence was inadmissible (p. 22).

This is currently the unanimous position of Canadian courts on the behavioural aspects of profiling, which also corresponds to our review of the scientific literature: the scientificity of criminal profiling is not always established so as to allow it to meet the requirements established in *Mohan* and *J.-L. J.*

Béliveau and Vauclair (2007) also approached two elements related to behavioural profiling: propensity and the evidence of similar facts. The use of expert testimony to establish the propensity of an offender to commit a crime is generally inadmissible:

> [TRANSLATION]
> …in *Morin*, a psychiatrist was deemed not to be able to testify regarding the propensity of the accused to commit the crime, since this type of evidence was also inadmissible. Similarly, the accused could not have an expert testify to show that, because of his mental state, he would be incapable of committing the crime of which he was accused. This would constitute evidence of a good reputation, which is normally given by persons testifying about the opinion of community members and by the accused who may refer to acts of good behaviour (p. 373).

However, an expert could testify if the accused and the perpetrator of the crime shared distinctive traits that were so unusual as to be like a signature. Consequently, according to the rule of exception in *Mohan*, when a crime or its perpetrator have distinctive characteristics, an expert may testify that the accused does not have the corresponding characteristics (Béliveau and Vauclair, 2007). However, these characteristics must prove to be completely distinctive and not just "abnormal."

In the case of evidence of similar facts, if it is relevant in principle, it will generally be inadmissible because its prejudicial effect frequently surpasses its probative value (Béliveau and Vauclair, 2007). This type of evidence is based primarily on the improbability of a coincidence of the crime elements being sufficiently distinctive to link the accused: [TRANSLATION] " … when the aim of this evidence is to prove the identity of the perpetrator of the crime, there must be a high degree of similarity between the acts in order to demonstrate that the accused is, not *the type of person* to have committed the crime, but *the very person* who committed it" (p. 231, emphasis is ours).

In the United States, however, the situation is slightly different, especially because of the differences in admissibility criteria between the states. It is clear that criminal profiling does not meet the requirements of *Daubert* or even *Frye* and that, when these criteria are applied, the testimonies based on the behavioural aspect of profiling are deemed inadmissible. This is notably

the case for rulings by the Superior Court (*State v. Fortin*, 1999) and the Supreme Court (*State v. Cavallo*, 1982) of New Jersey, the Ohio Court of Appeal (*State v. Lowe*, 1991; State *v. Roquemore*, 1993) and the Tennessee Court of Appeal (*State v. Stevens*, 2001). In addition, in cases where experts are called to testify, based on psychometric tests or penile plethysmography, about the concordance or non-concordance of the personality of an accused with the "typical" profile of a pedophile (as was the case in *Mohan* in Canada), Peters and Murphy (1992) observed that, with the exception of California, all the American courts that examined this question deemed the testimony inadmissible. The five types of objections raised are as follows: 1) the practice is not scientifically reliable, 2) the testimony would not be relevant insofar as it would not constitute added value for the rest of the elements of evidence, 3) the risk of usurping the jury's role of deciding the verdict of innocence or guilt is too great, 4) the grave risk of prejudice surpasses the probative value of the testimony, and 5) the reputation of the accused may be established without resorting to expert testimony.

In certain cases, however, the criteria adopted in *Frye* or *Daubert* are not considered applicable to the profiler testimony. For example, in *Simmons v. State* (2000), the Alabama Court of Appeal decided that deduction of the motive based on a crime scene examination constituted specialized knowledge not covered by *Frye*. It was therefore maintained that:

> Whether the offender received sexual gratification while committing the offence was a critical issue of the case, and [FBI expert] Neer's testimony was probative on that issue. Inferences had to be drawn from the physical evidence presented at the crime scene (p. 16).

Because this testimony was not subject to the criteria in *Frye*, it was not necessary to demonstrate that the method of inference used (to deduce from the crime scene and victim examinations that the criminal had committed this crime initially to satisfy a sexual desire) was widely accepted by the scientific community. The Court also mentions that Officer Neer's testimony did not, in his view, constitute a case of profiling, which is limited to the attempted application of the general characteristics of serial killers to a given individual. It has been advanced that this type of testimony is injurious and of little probative value. In light of other cases studied, this appears to be an exceptional decision in terms of the flexibility given to the expert and the nature of the testimony admitted as evidence.

In two other cases, the Delaware Supreme Court (*Pennell v. State,* 1991) and the Louisiana Supreme Court (*State v. Code*, 1993) admitted an analysis of the *modus operandi* and signature linking a series of homicides as evidence. Here again, the application of criteria established in *Frye* was explicitly avoided:

> [FBI] Agent Douglas […] was providing an expert opinion based upon his knowledge and experience in the field of crime analysis. This Court has held that when an expert's opinion is based solely upon his own knowledge and experience, the *Frye* test has no application (*Pennell v. State*, 1991, p. 7).

Note that the definition of profiling adopted in *Pennell* is the same as the one retained later in *Simmons* (see previous).

Elsewhere in the world, although France recognizes that certain expert opinions would be potentially admissible, the courts' reaction would currently be characterized by a certain degree of defiance, as shown by at least two quashed judgments following the admission of profiling testimonies (Marin, 2003). In England, Copson pointed out in 1995 that " … it is made abundantly clear that there are great and potentially insurmountable difficulties in introducing profiling evidence in British courts…" (p. 27). Ormerod (1996) added that there were no known cases where psychological profiles were admitted as evidence in England and France. Following a study of the legal implications of criminal profiling, he concluded that "The prejudice contained in a profile will in almost all cases exceed the limited probative value of such an opinion" (p. 877). Finally, Woskett, Coyle and Lincoln (2007) state that no testimony resulting from criminal profiling has yet been introduced in Australia and that the general opinion of Australian lawyers would be largely negative.

3.6.3 Implications

Given the previously mentioned admissibility criteria and Canadian case law, in order for criminal profiling to effectively contribute to the investigation phase, research must be done to establish a scientific method for doing so (*Mohan* and *J.-L. J).* This would involve 1) the development of theories to generate testable hypotheses; 2) submission of these hypotheses to factual testing within the framework of empirical research; 3) submission of the findings of this research to examination by the scientific community by publishing them in refereed journals; 4) ensuring replication of these results in order to establish, after meta-analysis, the reliability and margin of error in theoretical predictions, and 5) eventual recognition of the theory's validity by the scientific community.

This is no simple matter and would require years of concerted effort as well as a means of making criminal profiling a science.

3.7 Conclusions

3.7.1 Summary

We cannot logically conclude from our review of the research that behavioural profiling functions in a systematic manner. However, there is anecdotal evidence that profiling *can* work: we need only think of Brussels and the case of the Mad Bomber.

The literature is replete with approaches and typologies, but as Hicks and Sales (2006) point out, for the most part these models suffer from a lack of theoretical bases and empirical validation that could confirm and explain the links between crime scene elements and the everyday behaviours and personality of offenders. For these reasons, none of the proposed models can be considered "scientific" in the strict sense of the term, as confirmed by the courts on several occasions. Finally, several models fail to provide investigators with operational characteristics to describe potential suspects, so that the contribution to the investigation work is often limited. There are,

however, certain typologies that are satisfactory in this respect (for example, the organized/disorganized dichotomy of Douglas *et al.*, 2006).

Few empirical studies meet the rigorous criteria of credible scientific research. For example, Gray, Watt, Hassan and MacCulloch (2003) note the regular absence of a control group. In addition, much of the research, including Kocsis, cannot be applied to the Canadian or American context for the simple fact that it involves self-proclaimed profilers. Although rigorous enough, it could not reveal anything about the performance of profilers from the ICIAF training program. If we are to believe data from Copson (1995), profiling would lead to the arrest of offenders only 3% of the time in England and 8% by the FBI. This information dates back 15 years and was accumulated at the start of Canter and the ICIAF training program before the first profiles were produced. The situation has very likely evolved considerably since then.

In short, based on published research, while we are of the view that profiling can possibly contribute to police investigations, it is more of an art than a science. It has not yet been demonstrated, in our view, that profiling can systematically provide conclusive results. The use of databases to identify repeat offenders seems particularly promising, however. We also note that the practice of criminal profiling seems reasonably well supported in Canada; the ICIAF selection and training program should be able to keep the practice of profiling safe from charlatans. We are, however, of the opinion that profiling methods should be formalized, performance criteria should be developed, and empirical research should be undertaken to measure the true effectiveness of criminal profiling in Canada.

3.7.2 Limits

There are several limits to behavioural profiling research. First, each study contains a set of variables specific to the researcher's orientation and there is little overlap. In addition, because of strong competition among individuals calling themselves profiling experts, there is little exchange of technique. As a result, there is very little progress in the development of this discipline despite the growing interest of researchers. According to Muller (2000), "As long as the FBI has a monopoly on profiling (which it does in most western nations except Britain) and they decline to share any information, it will be very difficult to prove that it is worthwhile" (p. 260). We can subscribe to this position since, although we benefited from valuable collaboration from the ICIAF and the OPP, the FBI has indicated to us that they would not share any internal information.

In addition, there are several studies on profiling effectiveness formulated as internal surveys. For example, Kocsis and Hayes (2004) studied whether police had a positive preconception when they assessed a profile created by one of their counterparts compared to a profile created by a person whose training was not mentioned. In addition to revealing nothing about the effectiveness of profiling, these studies lack "naturalistic validity," in that they take place in a context that is different from the one in which profiling is normally practised.

These limits impact our evaluation of profiling insofar as they are principally guided by published research that is rare, often not very rigorous and conducted with self-proclaimed profilers.

3.7.3 Recommendations

[R1] – Inferential methods in behavioural profiling should be formalized and recorded (which does not mean, we should point out, that they must be made public, as criminals would then devise a method to defeat them).

[R2] – Performance criteria should be developed to evaluate the true effectiveness of behavioural profiling.

[R3] –Research should be undertaken to empirically evaluate the effectiveness of behavioural profiling in the Canadian context. This research should cover three particular aspects: 1) the performance of profilers compared to that of detectives who do not have such training (in order to establish the added value of profiling for conventional investigation methods), 2) profile accuracy (by comparing profiler predictions to offender characteristics in solved cases), and 3) the actual contribution of profiling to suspect identification and arrest.

4. Geographic profiling

Locating criminals constitutes a large share of the work of investigators (Canter, 1994). Geographic clues prove to be valuable for police forces during investigations, particularly in the case of repeat offences by the same individual (Rossmo, 2000). Geographic profiling used in this context may be defined as "... an information strategy for […] crime investigations that analyses crime scene information to determine the most probable area of offender residence" (Rossmo, 2000, p. 259). Some research indicates that the use of geographic profiling systems can reduce the area of investigation by 90% (Canter, Coffey, Huntley and Missen, 2000; Rossmo, 2000). Geographic profiling services provided by the police are intended for various cases: federal and provincial governments and various law enforcement agencies, particularly the RCMP, FBI and Scotland Yard (Rossmo, 2000).

According to Rossmo (2000), compiling geographic data along with information identified as useful to criminal profiling strengthens crime analysis tools. Thus, crime mapping has become a relatively common analytical practice for police services. The ability to use geographic data effectively is related to the use of geographic information systems (Rossmo, 2000).

In a survey of 2004 U.S. police departments conducted by Mamalian and La Vigne (1999), 85% of the respondents stated that crime mapping was a useful tool. The results of this survey also indicated that "crime clustering" and hot point analysis were the mapping applications most used. Information produced through mapping applications can also be subsequently compared with the information obtained, for example, through census and community members.

4.1 Theoretical framework

Geographic profiling has become an essential part of the criminal investigation process. The following sequence, proposed by Rossmo (2000), stipulates how geographic profiling fits into the investigation process:

1) Occurrence of a crime series;
2) Traditional investigative techniques;
3) Linkage analysis;
4) Criminal profile;
5) Geographic profiling; and
6) New investigative strategies.

In addition, the use of geographic profiling is based on a certain number assumptions, namely:

1) The profile must be based on multiple crime scenes (several crimes committed by the same individual or several sites linked to the same crime);
2) The crime scenes must be linked to the same offender;
3) There cannot be a great distance between the residence (or home base) of the offender committing the crimes and the area of criminal activity;
4) The crime scenes must be fairly evenly distributed around the offender's home or anchor point; and
5) The offender cannot move anchor points or operate from multiple anchor points during his or her crime series (Bennell and Corey, 2007).

In the simplest cases, the criminal's home is located at the centre of the crime pattern and may be discovered with the help of spatial analysis methods. However, most of the time the relationship between the crime scene and the criminal's home is much more complex (Rossmo, 2000).

Rengert (1996) proposes four hypothetical spatial patterns that could be used to describe the geography of crime scenes; (1) a uniform pattern with no distance-decay; (2) a bull's-eye pattern with spatial clustering, exhibiting distance-decay centered around the offender's primary anchor point; (3) a bimodal pattern with crime clusters centered around two anchor points; and (4) a teardrop pattern with a directional tendency toward a secondary anchor point. According to Rossmo (2000), in reality, these patterns are affected by various factors such as the configuration of the road system and traffic density, type of zoning and land use. All these factors contribute to limiting the scope of geographic profiling without making it ineffective.

In addition, Felson and Clarke (1998) presented three underlying theories of the practice of geographic profiling: routine activity theory, crime pattern theory and rational choice theory.

4.1.1 Routine activity theory

This theory was first developed as an explanation for predator crime. It postulates that in order for such crimes to occur, three components need to be present at the same time and in the same

space: a potential offender, a suitable victim and the absence of a guardian able to protect the victim. The risk incurred by the victim depends on four factors: target value, inertia, visibility, and ease of access. This theory assumes that the number of crimes can increase without an increase in the number of criminals if, for example, there are more potential victims or access is easier in the absence of an effective guardian. This has two implications for geographic profiling: crimes are committed particularly 1) in places corresponding to routine criminal activity, and 2) where it is relatively easy to commit crimes because of frequent time-space convergence of the three previously mentioned elements.

4.1.2 Crime pattern theory

This theory focuses on the way that persons and objects involved in criminal activities move in time and space. It links three concepts: 1) nodes (points of departure and arrival in the movement of individuals), 2) paths, and 3) edges (borders or limits between certain areas). Particular attention is given to the geographic distribution of crimes. This theory assumes that criminality is influenced by the characteristics of nodes, that it will be present more around nodes that lend themselves to crime and the paths that lead to them as well as in the proximity of certain borders that constitute sensitive spots.

4.1.3 Rational choice theory

This theory views the criminal as a rational being constantly involved in analyzing the costs and benefits of crime (Beauregard, Rossmo and Proulx, 2007). The emphasis is thus on the offender's decision-making since the basic postulate is that crime is a purposeful behaviour undertaken for some benefit. The theory is aimed at understanding individual criminal choices in terms of motivations in a given context offering opportunities to satisfy this motivation. In terms of geographic profiling, it determines that, since the place farthest from the anchor point incurs a cost, most offenders will commit their crimes reasonably close to their home (Beauregard and Rossmo, 2007; Brantingham and Brantingham, 1990).

Brantingham and Brantingham (1990) were also involved in geographic profiling using environmental criminology, which focuses more on the study of the crime context than criminal motivation. Thus, environmental criminology is based on the principle that a crime is the result of the confluence of 1) at least one criminal, 2) a victim (or a target of some sort), 3) laws in place and, 4) a given place and time. This means that crime analysis has four dimensions: a legal dimension, a criminal dimension, a victim (or target) dimension and a spatial-temporal dimension. Brantingham and Brantingham (1990) also add that these dimensions must be interpreted in historical, social, economic and political contexts, as well as on the basis of the biological and physical characteristics of the environment, since each of these characteristics contributes to creation of the context of the crime. For example, Tita and Ridgeway (2007) showed how the formation of street gangs influenced the prevalence and distribution of criminal activity.

Brantingham and Brantingham (1990) proposed that crimes are often committed within the context of daily life events and daily paths of individuals. Thus, individuals generally commit their crimes within close proximity of places where they spend most of their time, such as their home, place of work, school, businesses and recreational areas that they frequent. Similarly, individuals who are victims of criminal acts are generally in places they frequent, or along the paths that link these various places. This means not only that criminal events can be understood and predicted from a knowledge of the place where a criminal lives and frequents, but also that the crime can generally be understood and predicted through the analysis of the urban structure (arrangement of urban areas, road configurations, and transport system configuration).

Another environmental criminology theory maintains that crime scene location is determined through research and a structured decision-making process influenced by the criminal's perception of environmental clues that distinguish between a "good criminal opportunity" and a "bad criminal risk." These authors also maintain that spatial perception varies with the criminal's age.

Brantingham and Brantingham (1990) also pointed out the necessity of taking ecological labels into consideration. These are described as "reputations popularly appended to particular places or neighbourhoods" (p. 4) with an effect on crime. These labels especially influence the type of individuals (and socioeconomic group) who will be attracted or repulsed by a certain area and the perception that the police, social workers and other individuals have of it. They also affect criminals' perception of whether the area is an adequate one to commit a crime. These observations are consistent with the results of Dunham, Alpert, Stroshine and Bennett (2005) and Ingram (2007).

Based on urban structure and knowledge of perception and cognition in the criminal context, Brantingham and Brantingham (1990) came to the following conclusions:

1. Older cities, often characterized by a concentric shape with a dense core, have a crime distribution pattern with increased criminality in the proximity of the centre;
2. younger cities in the form of a mosaic have a more disparate criminal pattern;
3. younger cities with widely dispersed business districts have a higher property crime rate;
4. the development of major transport arteries leads to a concentration of criminal events close to highways, particularly close to major intersections;
5. areas developed using grids generally lend themselves to crime more than "organic street layouts";
6. older cities where low-income housing is dispersed throughout the area are likely to have a concentration of crimes close to the heart of the city and close to various low-income housing areas;
7. relocation of workplaces from the city core to the outskirts tends to increase the suburban crime rate;
8. major recreational complexes such as arenas are likely to increase the localized crime rate. If these complexes are located close to a residential area harbouring several potential criminals, the crime rate increases drastically;
9. Cities with a red light district in their core are likely to have a higher concentration of crime in that area. However, forcing the dispersal of typical red light activities will not

necessarily lead to a decrease in the total number of crimes, but will modify their spatial distribution.

4.2 Application

Various methods have been developed with a view to applying geography to the field of criminal profiling. The potential for the application of geographic information systems (GIS) in serial murder investigations has been recognized for a few years. Given that a GIS allows for the combination of geographic attributes and spatial data with other relevant data, it is a useful tool for organizing information that might at first glance seem disparate (Oatley, Ewart and Zeleznikow, 2006; Rossmo, 2000). According to Rogers, Craig and Anderson (cited in Rossmo, 2000), geographically coded information can be used to detect crime trends and recurrent patterns to confirm the presence of certain individuals in certain sectors and mark off areas where patrols should be concentrated. According to the same authors, GIS use could contribute to the identification of a serial killer through the retrospective analysis of known cases and could, by that very fact, prove useful in solving unsolved murder cases.

Three GIS models are currently in use for the geographic targeting of criminals (Paulsen, 2006). The first was developed based on research conducted by Simon Fraser University and the Vancouver Police Department. It was called the Criminal Geographical Targeting (CGT) model and was based on the theoretical model of Brantingham and Brantingham (1990). According to this model, the geographic coordinates of crime scenes are analyzed with the help of a distance decay function allowing for the production of a two- or three-dimensional spatial representation of the probabilities of locating the criminal's place of residence (Paulsen, 2006; Rossmo, 2000). According to Rossmo (2000), the CGT model proved valid and reliable when strict application criteria were respected, particularly for decreasing process subjectivity. For example, only the crime scenes recognized as such should be considered valid data as opposed to, for example, the place where the victim was seen for the last time. According to Rossmo (2000), the main limitation in the application of the CGT model is that it is less useful when the criminal has travelled long distances to commit his crime. However, it was pointed out by Rossmo (2000) that when a crime has been committed far from the criminal's place of residence, it is often possible to identify the criminal's workplace, a former residence or the residence of a relative or friend of the criminal in close proximity to the crime scene. This model uses two software programs: RIGEL and RIGEL Analyst (a simplified version of RIGEL).

The two other models are Canter's, which uses Dragnet software, and Levine's, which is based on Crimestat software (Paulsen, 2006). Unlike Rossmo's and Canter's models, Levine's model is based on the Journey to Crime (JTC) type. The distinction between the two approaches is that the JTC model is strictly statistical and not based on a theoretical framework of geographic profiling, as is, for example, Brantingham and Brantingham's model (Paulsen, 2006).

Nevertheless, Rossmo (2000) and Ainsworth (2001) note that it is important to keep in mind the fact that although the model produces very accurate results, it does not take the police right to the criminal's door. Geographic profiling software must be seen as information management systems

with a geographic perspective useful for the investigation process rather than a panacea. They could help prioritize certain suspects and focus patrol staff in a limited area and thus possibly shorten the time between the moment the crime was committed and the moment the criminal is apprehended (Rossmo, 2000).

4.3 Empirical support

4.3.1 Reduction of the search area

One of the advantages attributed to geographic profiling is the reduction of the surface area to be explored before localizing an offender's base of operations. According to the research available, geographic profiling could reduce the territory of investigation by 90% (Bennell, Snook, Taylor, Corey and Keyton, 2007). Research conducted by Beauregard and Rossmo (2007) is even more optimistic. According to them, the proportion of surface area that should be examined by police would be 7.1% for robbery, 5.1% for homicides, 4.7% for sexual assault and 2.2% for arson. These results are the same in terms of size as those obtained by Laukkanen and Santtila (2006), who obtained a median research area equivalent to 4.69% of the area covered by crimes. Canter and Larkin (1993) observed a median research area of 1.07% when the paths of offenders seem to correspond to the circle heuristic. However, when the offender travelled to the crime scene, predictions were much more inaccurate, with the median research area covering 24.06% of the total surface area.

4.3.2 Accuracy

The effectiveness and accuracy of geographic profiling can vary according to the type of crime. To locate a terrorist base of operation, for example, Bennell and Corey (2007) obtained rather inconclusive results with the Dragnet software. They pointed out the difficulty of profiling crimes where the perpetrators covered long distances. It seems that terrorism does not lend itself very well to geographic profiling since it is often the work of organizations with several bases of operation, and a series of attempts could involve more than one perpetrator.

In the case of burglary, Bennell, Snook, Taylor, Corey and Keyton (2007) observed a reduction in the margin of error in the prediction of the offender's place of residence by police officers with minimal training in the use of simple heuristics (circle heuristic and decay heuristic). Their performance after training surpassed that of a control group that had not learned to handle heuristics. This reduction in the error of prediction was more significant when the number of crimes profiled increased from three to five, then from five to seven. However, the true accuracy of the methods is difficult to evaluate since the results are provided solely in millimetres of deviation on a geographic map without conversion to kilometres (on a real scale).

Paulsen (2006) points out that the accuracy is generally modest: "Importantly, the results also seem to indicate that none of the strategies are very accurate, with the average error distance across all strategies being 4.45 miles, a significant distance in an urban area" (p. 316). In his comparison of seven computerized algorithms and three heuristic methods, Paulsen (2006) also

noted that the geographic profiles obtained using heuristic methods were, on average, more often correct than those provided by the seven software profiles, the place of residence being included in the profile obtained by the heuristic method 27.6% of the time versus 11.4% for computerized methods. This better performance would not be obtained at the expense of a loss of accuracy: "Importantly, these strategies also have a substantially smaller average top profile area than all but one probability distance strategy (negative exponential) indicating that their accuracy is not necessarily due to overly large average top profile areas" (Paulsen 2006, p. 316). The success rate of profiling, included as a percentage of profiles effectively containing the criminal's home, would be relatively modest according to these results (from 20% to 30% in the best cases).

4.3.3 Heuristics versus software

The preceding results emphasize that geographic profiling performance does not seem to depend on sophisticated software. Paulsen (2006) maintained that:

> These findings cast serious doubt as to whether a law enforcement agency needing to conduct a geographic profile would find any significant benefit in using a probability strategy over a simple [heuristic] spatial distribution strategy. This is all the more important given the cost to an agency, both financial and time wise, in acquiring and learning how to use a probability strategy over a simple to use and employ spatial distribution strategy (p. 327).

This position was also defended by Snook, Canter and Bennell (2002) as well as by Bennell, Snook, Taylor, Corey and Keyton (2007), who note that "… brief training on either the circle or decay heuristic was sufficient to increase officers' predictive accuracy. […] Both groups achieved an average accuracy that was better that the accuracy of computationally expensive methods [CrimeStat]" (p. 128). Snook, Taylor and Bennell had already arrived at such a conclusion about the use of the circle heuristic in research published in 2004.

4.3.4 Limits

The success of geographic profiling seems to depend on certain factors. For example, a significant distance between crimes and the criminal's place of residence as well as a wide dispersion of crimes seem to make profiling more difficult (Paulsen, 2006). If the number of serial crimes is too low (less than three) or too high (more than seven), it can also complicate the investigator's task. In addition, certain crimes such as car theft and burglaries seem to lend themselves better to geographic profiling.

Finally, geographic profiling assumes a series of crimes or crime scenes that can be attributed to the same offender (Paulsen, 2006). The reviewed studies do not convincingly demonstrate profilers' ability to associate a series of crimes to a given criminal. Some studies seem to suggest the feasibility of this association (Santtila, Fritzon and Tamelander, 2004; Santtila, Junkkila and Sandnabba, 2005). In other words, the basic premise in linkage analysis can apparently be demonstrated, but these studies are fraught with major methodological deficiencies. The validity

of the premises in which (1) one offender demonstrates a certain stability of criminal behaviours, and (2) different offenders adopt practices that enable differentiation between them is somewhat supported in the case of burglaries (Bennell and Jones, 2005; Woodhams and Toye, 2007). However, it appears that the distance between crimes provides a better basis for associating these crimes among them than any other behavioural factor. In the absence of sound empirical evidence that crimes may be related on the basis of behavioural factors, taking into account matching crimes and offenders (linkage analysis), an integral part of investigation work, could lower the observed success rate of geographic profiling.

4.4 Conclusions

4.4.1 Summary

It seems that the potential effectiveness of geographic profiling, particularly in terms of reduction of the search area, has been empirically demonstrated several times. In addition, this effectiveness is not dependent upon the use of software. Police knowledge of a limited number of simple heuristics seems to lead to results equivalent to those obtained by Crimestat, Dragnet, RIGEL and RIGEL Analyst software. Geographic profiling is based on a certain number of theoretical referentials among which some axioms have been empirically supported.

However, the practice of geographic profiling actually consists of two stages: 1) attribution of a series of crimes to the same offender, and 2) establishment of a geographic profile defining the research area with the greatest probability of containing the offender's residence based on the locations of various crime scenes. Although it has been empirically demonstrated that the second stage may be accomplished relatively efficiently, research is not able to judge the ability of investigators to complete the first stage. The effectiveness and usefulness of geographic profiling is based on the ability to accomplish both tasks in a reasonably accurate manner. Attribution of responsibility for a series of crimes to the same individual brings us back to geographic profiling, which has not been empirically proven. Certain studies suggest some temporal stability in the *modus operandi* and, especially, signature, particularly in the case of very personal crime (such as rape and homicide). In addition, these elements often have particular aspects that are distinctive enough to at least calculate the possibility of associating a suspect with a series of interpersonal crimes. However, the performance of profilers who do so does not seem to have been documented.

4.4.2 Limits

The main limit of the research reviewed was mentioned previously, specifically providing analysts with a series of crimes correctly attributed beforehand to the same offender. In reality, this first stage constitutes a challenge and a significant part of the investigation work. Empirical support of geographic profiling can thus only be considered partial. In addition, several research studies have been conducted by the writers of geographic profiling software themselves (Rossmo, Canter), which leaves some doubt as to their independence. Independent research clearly suggests that software use is not indispensable to the success of geographic profiling.

4.4.3 Recommendations

[R4] – The way in which geographic profiling coordinates are selected and entered should be standardized (for example, if an altercation starts in a bar, continues outside and ends in a homicide a few blocks away, which coordinate(s) mark the crime scene?).

[R5] –Research should be undertaken to evaluate the performance of analysts in the first stage of geographic profiling (attribution of crimes to the same suspect).

5. Prospective profiling

The practice of profiling may be described in terms of the time of profile development in relation to the crime, either before (*ex ante*) or after (*ex post*) (Harcourt, 2007). Criminal profiling, described in the preceding sections, constitutes *ex post* profiling, while prospective profiling is applied *ex ante*.

5.1 Context

The idea of applying formal or systematized prospective profiling to public security was inspired by the insurance field. The first research, conducted in the thirties at the University of Chicago, covered parolee recidivism. According to Harcourt (2007), this period corresponds to a transition, in the area of security, from punishment for past crimes to the prevention of future crimes by selective incapacitation. This period also announced the transition in the U.S. from clinical judgment to actuarial judgment, particularly because of the demonstrated superiority of the latter, which is less susceptible to cognitive bias and arbitrary decisions (Harcourt, 2003 ; Schauer, 2003). It was a paradigmatic shift not only in practice but also in terms of epistemology:

> …there was a shift toward a new mode of bureaucratic management of crime involving a style of thought that emphasizes aggregation, probabilities, and calculation instead of individualized determination –a new probabilistic *episteme* modeled on an actuarial or risk analysis approach to crime management (Harcourt 2003, p. 106).

This actuarial approach gradually led to the development of a hijacker profile in the sixties, and profiles of the drug courier, people smuggler and terrorist in the seventies (Harcourt, 2003). The use of these practices in the justification of "reasonable suspicion" notably received the endorsement of the U.S. Supreme Court in *US v. Sokolow*: " …the [US] Supreme Court concluded that comparing law-enforcement observations with a predetermined drug-courier profile was sufficiently connected to specific and articulated facts to satisfy any applicable constitutional requirements" (Schauer 2003, p. 170).

Nevertheless, prospective profiling and the extent of its use gave rise to intense debate in Canada and the United States. In the U.S., the Fifth Amendment of the Constitution stipulates that no person shall be "deprived of life, liberty, or property without due process of law" (Cornell University Law School, 2008). In Canada, section 3 of the *Canadian Human Rights Act* stipulates

that, "For all purposes of this Act, the prohibited grounds of discrimination are race, national or ethnic origin, colour, religion, age, sex, sexual orientation, marital status, family status, disability and conviction for which a pardon has been granted" (Government of Canada, Department of Justice, 1985). These elements define the work of law enforcement agencies, which have a presumption of justice in the performance of their duties: "A government policy that violates fairness in its treatment of individuals is presumed to be wrong and hence requires an affirmative defence. The burden of proof is on the advocate of the policy to argue that the violation meets other social goals in a way to overcome the violation" (Durlauf, 2005, p. 134). In this context, to justify the use of prospective profiling, especially if sensible criteria covered by the *Canadian Human Rights Act* are part of the profile, it is up to security agencies to demonstrate that the advantages of profiling outweigh the disadvantages.

5.2 Definitions

The basic principle of prospective profiling, since the almost general abandonment of the clinical approach, "is to develop correlations between specific criminal activity and certain group-based traits in order to help the police identify potential suspects for investigation. [Prospective] Criminal profiling uses probabilistic analysis in order to identify suspects and target them for surveillance" (Harcourt, 2003, p. 109). This is an actuarial approach (as opposed to a heuristic approach) since it is not based entirely on an evaluation of probabilities, but also on the establishment of statistical correlations between group membership defined by certain traits and the prevalence of criminal activities (Harcourt, 2007).

Insofar as prospective profiling does not necessarily use race as a criterion, it must be distinguished, at least in theory, from racial profiling, which uses race alone or in conjunction with other factors as an indicator of criminality (Ramirez, Hoopes and Quinlan, 2003). For Glaser (2006), racial profiling refers to "…the police practice of focusing on members of particular race (or ethnic or national origin) groups for extra surveillance" (p. 396). This distinction is important since the effectiveness of *prospective* profiling in general and the effectiveness of *racial* profiling in particular are two related, but different issues.

5.3 Fundamental assumptions

The practice of prospective profiling is based on two fundamental assumptions (Glaser, 2006; Harcourt, 2003): 1) the rate of criminality of the members of certain social groups is proportionately higher than their representation in the general population, and 2) if such a situation is observed, it is fair and effective to target these groups in proportion to their criminality rate in the allocation of police resources.

In addition to these two assumptions, it is presumed that criminals act rationally and will consequently react to the fluctuation of the probability of being caught. This is the logic of deterrence: the assumption is that if the probability of being arrested for a crime increases for a given group, the crime rate will decrease accordingly (Harcourt, 2007).

In the context where police resources are not unlimited, this postulate also implies that 1) the addition of resources to target a given group corresponds to a decrease of resources for the supervision of other groups, and 2) groups with less supervision will also react rationally and consequently increase their criminal activity. In this case, as Harcourt explains (2007), "[prospective profiling] will only increase the general welfare of society if it has the effect of decreasing overall crime in society, and this will only happen if the members of the higher-offending targeted group have the same or greater elasticity of offending to policing" (p. 123). By "elasticity," Harcourt means the capacity of groups to react to changes in police strategies. This condition of equivalent elasticity would, according to Harcourt, be quite unlikely since, if the criminality of the target group is higher, an elasticity lower than or equal to the non-targeted group would be surprising.

5.4 Limits to the applicability of the actuarial model

If the actuarial model prevails, it is because, at least in the case of predicting recidivism, its application has proven to be more effective than the clinical approach. However, its theoretical extension to all types of prospective profiling is limited by several factors. First, empirical research has failed to show the effect of prospective profiling on criminality. Consequently, the probabilities used in the models and simulations do not have any empirical basis (Durlauf, 2005; Gold, 2003; Harcourt, 2007). According to Glaser (2006), this is because there is currently no data allowing for a rigorous study of the effect of prospective profiling (racial in this case) on criminality: "In fact, the General Accounting Office attempted to study the prevalence and impact of racial profiling, only to conclude that the data to make such judgments are not available and the Legislative Analyst Office (LAO) of the state of California more recently drew a similar conclusion" (p. 397). For example, Harcourt (2007) explained that the study on the effect of racial profiling on the drug trade lacks data on the long-term effect of profiling on the total number of motorists (targeted and non-targeted) carrying illegal drugs.

Then, according to the model adopted, the same data can be interpreted differently. Let us take the example of equivalent hit rates between groups when one of the groups is targeted more by police searches. Ramirez, Hoopes and Quinlan (2003) propose that this situation demonstrates that the presumption that the targeted group is more likely to commit a criminal offence would be false, since the groups seem to offend proportionately in an equal manner. They conclude that profiling would not be justified in this case since the first basic postulate presented previously would not be respected. However, Harcourt (2003, 2007) interprets this situation as a state of equilibrium reached when target group profiling brings it back to the same level as non-targeted groups by decreasing the crime rate. For him, the equivalent propensities of both groups to contravene the law can be demonstrated only by observing equal crime rates when no group in particular is targeted by law enforcement agencies.

The study of prospective profiling within the context of terrorism prevention would be even more arduous. According to Harcourt (2007), the base-rate of terrorist attacks on American soil make them particularly difficult to prevent and detect, while allocating more time to terrorist organizations to change their *modus operandi* so as to thwart antiterrorist measures. For their part, Ramirez, Hoopes and Quinlan (2003) state that "Using race, ethnicity, or nationality in this

more amorphous context [War on Terror] greatly diminishes its usefulness in narrowing the class of suspects" (p. 1227) since the authorities do not generally have a definite time interval, specific place or description of the crime to be committed or suspects as a basis for targeting their surveillance efforts.

5.5 General evaluation of the potential of prospective profiling

For Schauer (2003), for the use of prospective profiling to be justified, it must take into account a society's values and sensitivities. For example, targeting actions that would not in themselves constitute a crime but have become illegal because legislators consider that they generally lead to criminal acts is not controversial (for example, the possession of a sawed-off weapon or neglecting to declare the carrying of large quantities of currency to a foreign country). However, the inclusion of race as an indicator of criminal activity in a profile arouses lively reactions and frequently leads to moral or ethical debate, regardless of the potential effectiveness (Durlauf, 2006; Lever, 2005; Risse, 2004; Risse and Zeckhauser, 2003).

For Tyler (2005) and Durlauf (2005), racial profiling derogates from the presumption of justice without empirical justification: "In the [racial] profiling context, the Fairness Presumption leads to the conclusion that [racial] profiling is not justified since there is no affirmative case to be made in terms of effectiveness, whereas there is an unambiguous fairness violation" (Durlauf 2005, p. 134). This objection, which can apply to all sensitive criteria of the *Canadian Human Rights Act,* also implies consequences in terms of social stigma toward targeted groups and a breach of confidence between communities and police forces. As pointed out by Ramirez, Hoopes and Quinlan (2003):

> …when law enforcement practices are perceived to be biased, unfair, and disrespectful, communities of color and other minority groups are less willing to trust and confide in law enforcement officers and agencies, to report crimes that come to their attention, to provide intelligence and information, and to serve as witnesses at trials (p. 1196).

In this context, it is not unlikely that the impact resulting from prospective profiling and its consequences to be generally negative.

For Harcourt (2007), the problem resides instead in the fact that if prospective profiling is applied dynamically so that the allocation of police resources is regularly readjusted, it is liable to amplify group inequalities in terms of arrests and prison representation: "[Prospective] profiling, when it works, is a self-confirming prophecy. It aggravates over time the perception of a correlation between the group trait and crime" (p. 154). In addition, the phenomenon of differences in elasticity could result in decreased criminality in the target group. However, an overall rise in criminality could result, because the non-targeted group—generally the majority— could react to decreased surveillance by committing an increased number of offences. This opposite effect has never been empirically documented.

Finally, especially for crimes with a low base rate, the risk of false positives and false negatives is high (Harcourt, 2007; Ramirez, Hoopes and Quinlan, 2003). For example, in the war against terrorism, a profile targeting young men from the Middle East would be more or less blind (depending on other criteria) in the cases of John Walker Lindh (American, White), Zacarias Moussaoui (African with a French passport) and Richard Reid (half Indian, half English with an English passport). The case of Moussaoui is particularly interesting since he was allegedly arrested based on behavioural criteria considered suspicious by his flight instructor (he had paid for his registration in cash, wanted to fly commercial planes but had no basic training, was not interested in learning how to take off or land, did not understand questions asked in French but claimed to be French and became hostile when questioned about his past).

5.6 Empirical support

5.6.1 Anti-drug trafficking effort
5.6.1.1 Context

Note first that profiling is out of the question in a case where the arrest and search do not depend on the discretionary power of officers, "Simply stated, an officer cannot be determined to be racially profiling when organizational rules and/or state codes compel them to act" (Liederbach, Trulson, Fritsch, Caeti and Taylor, 2007, p. 117). In this perspective, the first drug trafficker profile was created in 1974 by Officer Paul Markonni from the Drug Enforcement Administration (DEA) when he was assigned surveillance duty at the Detroit Metropolitan Airport (Robin, 1993). Several factors could have been included in the profile, but the most common factors are 1) arriving at or departing from a city known to be a source of drug supply; 2) having little or no luggage or several empty suitcases; 3) travelling with a fairly uncommon itinerary (for example, taking a short round trip with considerable travel time or making a last-minute reservation); 4) using a false name for registration; 5) having a large amount of cash on him or in his luggage; 6) pay for his airline ticket in small denominations; and 7) displaying unusual nervousness or making furtive movements (Robin, 1993). Although several denounce the use of these factors because many of the factors could include a large proportion of innocent travellers (Robin, 1993), it nonetheless remains that during the eighteen months of the profiling program at the Detroit Metropolitan Airport officers searched 141 persons and arrested 122 for drug trafficking (Robin, 1993).

5.6.1.2 Use of profiling

Although the effectiveness of a profile may in this case have been at least partially demonstrated, many people convicted of possession of drugs as a result of profiling have appealed their sentence on the grounds that profiles cannot be used as evidence, particularly if they include race or ethnic origin. Gabbidon, Marzette and Peterson (2007) indicated, however, that in 56.3% of the 76 cases pleaded before U.S. courts, the person accusing law enforcement agencies of racial profiling were actually convicted of criminal activities. Only 31.1% of the cases were won by individuals alleging injury. In the U.S. the number of appeals is now declining. One of these cases is *Reid v. Georgia* (United States Supreme Court, 1980). In this case, the accused was arrested by a DEA agent upon arrival at the Atlanta Airport under suspicions based on profile

factors. Although the agents found cocaine in the bag of the accused, the Court of Appeal reversed the decision against the accused because "the profile factors used by DEA agents to seize him were insufficient to establish 'reasonable suspicion,' the *sine qua non* for making an investigatory stop" (Robin 1993, p. 45). However, the legality of the profile was recognized by the Supreme Court in 1989 in *United States v. Sokolow* (United States Supreme Court, 1989). In this case, the accused was detained at the Honolulu Airport with 1,063 grams of cocaine. There were several clues that he might be a drug trafficker, including the fact that he stayed in Miami (a hub for drug trafficking) for only 48 hours while a flight to his destination took twenty hours, that he paid $2,100 for two return tickets in twenty-dollar bills and that he seemed nervous during his trip (United States Supreme Court, 1989). Although the accused successfully appealed his conviction, the case went back to the Supreme Court, which quashed the decision of the Court of Appeal and upheld the conviction. In this case, the Supreme Court referred to the fact that "although each of these factors is not by itself proof of illegal conduct and is quite consistent with innocent travel, taken together, they amount to reasonable suspicion that criminal activity was afoot." (p. 7) In addition, it was specifically stated that "[t]he fact that the agents believed that respondent's behaviour was consistent with one of the DEA's 'drug courier profiles' does not alter this analysis, because the factors in question have evidentiary significance regardless of whether they are set forth in a 'profile'" (p. 10).

In a context other than airport border control, when it is a matter of prospective (especially racial) profiling for drug trafficking, the literature often focuses on the stop and search of highway motorists who are suspected drug traffickers. In this case, the first profile of the highway drug courier was developed in Florida in 1984 by patroller Bob Vogel, who analyzed thirty major cases of arrests for drug transport over a period of thirteen months. Vogel ended up with a list of similarities: the vehicles were often occupied by two young African American men between the ages of 20 and 45 travelling below the night time speed limit in a rental car from another state, heading north along Highway 95, the main route for drug couriers taking their goods to Miami and then heading to Northeastern markets (Robin, 1993). After the motorist was detained, other factors entered into play in the profile, including the presence of a radar detector and divergent passenger responses (Robin, 1993). According to this same author, profiles are judicially valid in other states when the profile factors are complemented by other clues before or after questioning. Use of these profiles was facilitated by the U.S. Supreme Court judgment in *Whren v. United States* (United States Supreme Court, 1996), which decided that the use of minor traffic violations as a pretext for stopping and searching a vehicle when patrollers suspect the occupants of trafficking in narcotics does not violate the Constitution (Birzer and Birzer, 2006; Withrow, 2007).

Several studies have shown that African Americans are more likely to be stopped and searched, incarcerated, refused parole with bail and charged than Whites (Gaines, 2006; Schafer, Carter, Katz-Bannister and Wells, 2006; Stokes, 2007; Withrow, 2007). In addition, most research has found in varying degrees that police questioned persons from ethnic minorities disproportionately and that these persons were treated differently from white people during the interactions (Novak, 2004). The reason advanced to validate the use of racial profiling is simple: racial profiling is seen as increasing the probability of seizing a large quantity of drugs (Gross and Barnes, 2002). The study by Gross and Barnes (2002) is one of the only studies that objectively examines the validity of racial profiling as a tool in the fight against drug trafficking. The authors studied the data gathered by the Maryland State Police (MSP) between January 1995 and June 2000 in order

to determine whether this police force was carrying out racial profiling and if it proved useful against drug trafficking. One of the findings of the study showed that Black motorists who were questioned on the highway were three times more likely to be searched than White motorists and that Hispanic drivers were seven times more likely to be searched than White individuals. In addition, the data illustrated that African Americans who committed a traffic offence were almost twice as likely to be questioned as White motorists committing a traffic offence and three times more likely to be searched. Although the data do not reveal the proportion of Hispanic motorists questioned and searched, the authors estimated that the probability of a motorist being stopped and searched was seven times higher than for a White motorist, despite the fact that these individuals seemed, statistically, less likely than Whites and African Americans to carry illegal drugs. In addition, in the majority of cases where police discovered drugs while questioning the motorist, the motorist had a small quantity in his possession, which is related more to personal use than trafficking.

It seems that ethnic origin is accompanied by other factors, such as behaviour, age and sex in the formation of officers' suspicions (Dunham, Alpert, Stroshine and Bennett, 2005). In addition, the formation of suspicions will connect race with place (Ingram, 2007): this was particularly the case of the young Black man in a wealthy neighbourhood inhabited by a majority of Whites. Thus, Meehan and Ponder (2002) noted in their study that "African Americans who travel in sectors F and H, which are adjacent and contain the largest pockets of wealthier white neighbourhoods, have query rates that are 325% and 383% greater than their number in the driver population" (p. 417). They added that " …although African American hit rates are somewhat higher overall, an analysis by place shows that queries are the highest for African Americans where hits are the lowest. Therefore, considerations of place, not the productivity from hits, drives the African American query rate" (p. 420).

It should be mentioned that, despite the passing of legislation prohibiting the use of racial profiling (except in cases involving the identification of a potential terrorist), about one in every five police officers in the U.S. still believes that this is a perpetual problem in his department (Ioimo, Tears, Meadows, Becton and Charles, 2007). In addition, the relationship between race and place, established notably by Meehan and Ponder (2002), is found in police discussions but reversed: the police give an example of the situation of a young White male suspect in a poor, Black neighbourhood known for drug trafficking. For Glover (2007), this discursive adjustment translates into the maintenance of a stereotype but also a greater awareness that it is a sensitive subject, hence this asepticized adaptation.

5.6.1.3 Effectiveness of profiling

Despite the use of race in profiles, there is no conclusive study demonstrating that Blacks are more likely than Whites to be involved in drug trafficking, and certain findings suggest that Hispanic persons are even less so. For example, Welch (2007) points out that national investigations show no differences in drug use between ethnic groups. In the study presented by Gross and Barnes (2002), use of driver ethnic origin did not improve the MSP hit rate. Research on the hit rates of traffic stops indicates that drugs were found in vehicles belonging to people from visible minorities in a lesser percentage than in a vehicle driven by a White person (Batton and Kadleck, 2004). These findings correspond to those presented by Schafer, Carter, Katz-

Bannister and Wells (2006) and Withrow (2007). Following a critical review of existing research, Ramirez, Hoopes and Quinlan (2003) stated that:

> [I]n many instances, especially in the context of narcotics distribution and other non-violent crime, it is impossible to identify the degree to which the higher rate of arrests and convictions among males of color reflects a greater focus on and willingness to arrest and prosecute them or if it reflects a greater incidence of actual criminality. […] In the context of drug interdiction and traffic stops, data disproves the presence of a circumstantial correlation between race and criminality (p. 1211).

Gross and Barnes (2002) conclude that "Racial profiling on interstate highways inflict[s] heavy costs on thousands of innocent minority motorists in an attempt to find a few dozen drug dealers, and it achieves nothing in return. […] The impulse that fuels the practice - to increase the haul of illegal drugs - also provides a measure of its success, and by that measure it is an unqualified failure" (p. 753). We conclude that although profiling seems useful against drug trafficking, especially in airports, using race as a criteria does not improve effectiveness. In this sense, given the impact on the perception of justice and interethnic relations, racial profiling could even be counter-productive.

5.6.2 Fight against terrorism

In August 2008, 40 terrorist organizations were recognized by the Canadian Security Intelligence Service (CSIS). Of these 40 organizations, 22 claimed to be Islamist and 19 were aiming for the creation of a Muslim state (independent or following the overthrow of a secular government). More than half came from a country with a Muslim majority (Government of Canada, Department of Public Safety, 2008). In this context, the use of profiling to fight terrorism clearly involves a racial or religious component (Barak-Erez, 2008). However, there does not appear to be consensus on the definition of terrorism itself. As Schbley (2003) explained, "…this is why past and present presidents of the United States (Nixon, Reagan, Bush, Clinton, and Bush), and many foreign leaders (Thatcher and Chrétien) to mention but a few, have stated 'what is terrorism to one is freedom fighting to another'" (p.106).

In general, there are two types of anti-terrorism initiatives. The first type constitutes a defensive or dissuasive approach (Harcourt, 2006). It involves policies aimed at predicting or averting a terrorist attack and reducing the number and gravity of victim injuries. This type of preventive policy includes the development and deployment of technological measures such as airport metal or explosive detectors, profiling and enhanced protection for potential foreign targets. The second type consists of preventive or proactive actions with the goal of dismantling terrorist organizations by means of infiltration, preventive attacks or invasions of countries harbouring terrorist organizations (Harcourt, 2006). However, as pointed out by Lum, Kennedy and Sherley (2006), the question of the effectiveness of these measures and their potentially perverse effects is crucial but not often explored.

For example, anti-terrorism measures may have effects contrary to those anticipated. Empirical studies tend to show that there is significant potential for a substitution effect (Harcourt, 2006; Lum *et al.*, 2006). For example, the installation of airport metal detectors in 1973 resulted in a significant decrease in the number and percentage of international airplane hijackings, but also led to a sudden, proportionately greater increase in bombings, assassinations and hostage taking (Harcourt, 2006). Information from Lum *et al.* (2006) showed that:

> …while airport security may decrease airplane hijacking, other types of terrorism may have increased during the same time, such as miscellaneous bombings, armed attacks, hostage taking, and events which included death or wounded individuals (as opposed to non-casualty incidents) in both the short and long run (p. 503).

Another type of substitution observed in the last two decades, the increase in suicide attacks by women and children, could be a direct result of profiling young men from the Middle East. Such substitutions have been documented in organizations such as the Kurdistan Workers' Party (PKK), Tamil Tigers (LTTE) and the al-Aqsa Martyrs' Brigades (Cronin, 2003).

Literature on the use and effectiveness of profiling as an anti-terrorism tool is rare. Among the obstacles to the study of terrorists, Hudson (1999) and Schbley (2006) refer to the absence of biographical databases (existing databases generally documenting events rather than their perpetrators) and restricted access to terrorists, even those who are incarcerated (those generally refusing to reveal sensitive information). In a review of writings compiled by Lum *et al.* (2006), the authors found more than 20,000 articles and books on anti-terrorist measures. However, only seven empirically valid articles could be analyzed. In addition, several articles provided a primarily subjective evaluation, with no empirical support:

> …there is no reliable empirical evidence that racial profiling is an effective counterterrorism measure and no solid theoretical reason why it would be. The possibility of recruiting outside the profiled group and of substituting different modes of attack renders the racial profiling in the counterterrorism context suspect (Harcourt 2006, p. 3).

Cronin (2003) offered a similar point of view, arguing that there appears to be no such thing as a terrorist "profile": "Some have argued that there is no pattern to these [suicide bombers] 'profiles' at all. In any case, as we move into the twenty-first century, stereotypes about who is likely to carry out terrorist suicide attacks are evaporating" (p. 8). Hudson (1999) shares this view. After emphasizing the abundance of typologies and often contradictory theories and pointing out the absence of solid empirical bases, he concludes that:

> The isolation of attributes or traits shared by terrorists is a formidable task because there are probably as many variations among terrorists as there may be similarities. Efforts by scholars to create a profile of a 'typical' terrorist have had mixed success, if any, and the assumption that there is such a profile has not been proven. […] People who have joined terrorist groups have come from a wide range of cultures, nationalities, and ideological causes, all strata of society, and diverse professions. Their personalities and characteristics are as diverse as those

of people in the general population. There seems to be general agreement among psychologists that there is no particular psychological attribute that can be used to describe the terrorist or any 'personality' that is distinctive of terrorists (p. 43).

The systematic targeting of persons of Middle Eastern descent constitutes an example of racial profiling, a measure receiving some popular support in a context where the population is prepared to exchange certain rights and freedoms – or those of others – for the sake of security (Bahdi, 2003; Barak-Erez,2008; Gross and Livingston, 2003; Viscusi and Zeckhauser, 2003). According to Harcourt (2006), the success of profiling depends on two factors. First, for a given group, detecting and preventing terrorist acts would depend on identifying a stable trait correlated with a higher rate of criminality for the targeted crime. Second, deterring and preventing terrorist acts would be related to how various groups respond to new measures and policies and their propensity to adopt different forms of substitution.

A problem inherent in the study of terrorism is the rarity of events. According to Harcourt (2006), the probability of obtaining tangible benefits with profiling is largely a function of the frequency of the profiled incident. The higher the frequency of terrorist attacks, the more often profiling will likely detect this type of act:

> Low base-rate events, however, are far more difficult to predict, and as a result much harder to detect for several reasons. First, it is extremely hard to predict where, when, or how the low base-rate offence will occur. Second, low frequency affords more time to adjust to any counterterrorism measures (Harcourt 2006, p. 12).

In Europe, data from the British Home Office confirm that police had been targeting Muslims since September 2001 in their fight against terrorism. However, out of a total of 21,577 stops and searches since that date, none has resulted in a charge for a terrorist offence (Goldston, 2006). One method of investigation likely to use profiling is data mining, which involves searching a database for individuals with certain characteristics. An example of this use of data is the *Rasterfahndung* (profiling operation) conducted by German police from the end of 2001 to the beginning of 2003 (Goldston, 2006). In this large-scale operation, police gathered several pieces of personal information from public and private databases on approximately 8.3 million individuals. Profiling was based on the characteristics of members of the Hamburg cell, to which Mohammed Atta, one of the principal air pirates of the September 11 attacks, belonged. No terrorist suspect could be identified (Goldston, 2006). In May 2003, the European Union Network of Independent Experts in Fundamental Rights warned that the proposed terrorist profiles presented a major risk of discrimination. Their report states that:

> …the development of these profiles for operational purposes can only be accepted in the presence of a fair, statistically significant demonstration of the relations between these characteristics and the risk of terrorism, a demonstration that has not been made at this time (EU Network of Independent Experts in Fundamental Rights, 2003; cited in Goldston, 2006, p. 6).

Again according to this research group, even if someone managed to develop a terrorist profile based on concrete, factual data, any profile based partially on race could not be valid given the prominence of physical appearance in human perception:

> The social psychology of race and ethnicity indicates that, because of their visibility, these attributes are prone to be assigned greater weight in practice than the other elements of the profile, and thus distort the profile (p. 16).

It may seem necessary to support by an example the demonstration of the weak predictive validity of race or religion as regards terrorism. This conclusion actually seems counter-intuitive with respect to the proportion of terrorist acts committed by Islamist organizations. This apparent contradiction arises from the frequent confusion, at the level of logic, between two types of conditional probabilities. Let us do an analytical exercise (illustrated uniquely by Islamist terrorism because that is what currently on the minds of the public). In 2006, Canada's population included about 783,700 Muslim citizens. Now let us suppose (to pick a purely fictitious and certainly exaggerated figure) that 500 of those are terrorists. In addition, let us suppose, again uniquely for purposes of illustration, that 90% of the terrorist attacks in Canada were the work of Muslims and that this trend has continued (which is not the case at all, since none of the terrorist acts committed on Canadian soil have been attributed to an Islamic group up until now; anti-Castro groups, Sikhs, Armenians, extreme leftists and the FLQ have been responsible for the vast majority of these attacks).

Let us consider proposition M (where individual X is Muslim) and T (where individual X is a terrorist). The perception that Muslim profiling would be an effective anti-terrorist measure is based on confusion between two conditional probabilities:

1. The probability that a terrorist is Muslim, $P(M|T)$, set here (in an exaggerated manner for the Canadian reality) at 90%; and

2. The probability that a Muslim is a terrorist, $P(T|M)$, obtained from the relationship 500/783 700, or 0.06% (a small probability but already exaggerated)

The effectiveness of profiling is based on the postulate that the second probability, $P(T|M)$, is high enough to establish the relevance of increased Muslim monitoring. Here, this monitoring would be justified in only 0.06% of the cases (a waste of time, energy and money in 99.94% of the cases), which explains the low predictive validity of this criterion. Note that this example does not touch on the problem of false positives and false negatives, which is illustrated in the box on page 74.

5.6.3 Evaluation of recidivism risk

Another application of prospective profiling would be to prevent recidivism in incarcerated individuals about to be released. Most of the literature on recidivism focuses on the rate of relapse, behavioural and psychological clues, and the criminal record of individuals with previous convictions for sex offences or particularly violent crimes (Barbaree, Seto, Langton and Peacock, 2001; Côté, 2001; Proulx and Lussier, 2001; Hanson and Brussière, 1998; Quinsey, Harris, Rice and Lalumière, 1993; Furr, 1993; Harris, Rice and Quinsey, 1993; Harris, Rice and Cormier, 1991). This interest may be explained by the enormous implications of potential relapses (Proulx and Lussier, 2001; Barbaree *et al.*, 2001; Hanson and Brussière, 1998).

It is difficult for clinical psychiatrists to predict violence. For example, Lidz, Mulvey and Gardner (1993) reported an overall success rate of 53% over a six-month period. Clinicians tend to underestimate violent behaviour by women, and their performance was not significantly superior to a random prediction. These statistics already constitute an improvement in relation to those of the sixties and seventies, when the success rate for clinicians was around 35% at best (Dolan and Doyle, 2000; Monahan, 1996). Evaluating the recidivism risk has thus gradually gone from being a clinical approach to an actuarial approach, notably because of the demonstrated superiority of the latter (Ægisdóttir, White, Spengler, Maugherman, Anderson, Cook, Nichols, Lampropoulos, Walker, Cohen and Rush, 2006; Monahan, 1996; Parent, Guay and Knight, 2008), even though it could be termed modest in comparison with certain self-reported measures (Walters, 2006). Thus, the application of various actuarial measures (including the *Rapid Threat Assessment for Sexual Offense Recidivism*, *Sex Offender Risk Appraisal Guide*, *Violence Risk Appraisal Guide*, *Minnesota Sex Offender Screening Tool – Revised* and *Static-99*), often used in recidivism threat assessments of incarcerated individuals, who often have severe personality, mental or psychopathological disorders, has been evaluated by several authors in recent years.

5.6.3.1 Frequency of recidivism

Recidivism rates vary noticeably from one study to another, from very low to very high (Bartosh, Garby, Lewis and Gray, 2003). These differences may be caused in part by the range of crimes and offences included in research, as well as the recidivism measures used by the authors. Thus, certain research focussed specifically on relapses in the same category as the crime for which the individual was charged, while others also included new types of offences. In addition, certain studies used conservative recidivism measures, such as a new charge on police documents, while others use more flexible indicators such as cases of self-reported recidivism and offences on which the individual has not been charged.

In their meta-analysis including data on 23,393 sex offenders, Hanson and Brussière (1998) reported an average recidivism rate of 13.4% for various types of sexual assault over a follow-up period of four to five years. More specifically, this rate is 18.9% for 1,839 rapists and 12.7% for 9,603 child molesters. These authors report a recidivism rate for non-sexual violence by sex offenders of 12.2%, although significant differences may be observed between rapists and child molesters (22.1% vs. 9.9%, respectively). When recidivism is defined as being any new offence, this percentage increases to an average of 36.9% (36.3% for child molesters and 46.2% for rapists, respectively). In general, Harris and Rice (2007) suggest that if a group of sex offenders is followed for a sufficient length of time (over fifteen years) the rate of sexual recidivism will exceed 30%.

In their review of the literature, Proulx and Lussier (2001) reported an average recidivism rate of 20.4% for child molesters (range of 4% to 38% based on seventeen studies). With respect to fluctuations observed in the potential recidivism risk, a study by Hanson, Steffy and Gauthier (1993) showed that the recidivism rate for child molesters was 5.2% for the first six years of follow-up and dropped to about 1.8% per year for the following 20 years.

The recidivism rate for sexual assault of females was higher than for child molestation (Quinsey, Rice and Harris, 1995; Hanson and Brussière, 1998). The recidivism rate for sexual assault of females reported by Quinsey *et al*. (1995) is 22.8%. These authors reported a range of 10% to

36% based on seven studies. However, note that the impulsiveness shown by the aggressor seemed to influence the likelihood of relapse. According to Prentky, Knight, Lee and Cerce (1995), incarcerated offenders demonstrating a higher level of impulsiveness were three times more likely to re-offend than those who were not classified as impulsive. These authors report a relapse of 35% among impulsive sex offenders (vs. 13% for offenders who are not very impulsive).

Various researchers have also studied the recidivism rates of individuals who had previously committed violent crimes. For example, a study conducted by Hanson, Scott and Steffy (1995) focussed on the recidivism rates of individuals who had committed sex offences and those who had been charged with violent crimes. They reported that 83.2% of the individuals who had committed non-sexual crimes and 61.8% of the individuals who were child molesters were convicted of a new crime in a follow-up conducted fifteen to thirty years after their release. These two groups tended to repeat the same type of offence that led to their previous incarceration. This result agrees with the observation by Hanson and Brussière (1998) that individuals who commit non-sexual crimes do not tend to repeat with sex offences, although sex offenders also tend to commit other types of offences.

Interest in the factors surrounding recidivism of young offenders seems to have arisen in the scientific literature in recent years. A meta-analysis of general recidivism in young offenders (Cottle, Lee and Heilbrun, 2001) reported an average recidivism rate of 48% over a 45-month period. A study conducted by Catchpole and Gretton (2003) revealed a recidivism rate of 23% for youth violence.

Finally, cases of recidivism in individuals with severe psychological disorders was also a subject of interest to certain researchers (Harris, Rice and Cormier, 1991; Harris, Rice and Quinsey, 1993; Côté, 2001). According to a study conducted by Harris, Rice and Cormier (1991), 40% of the incarcerated population studied reoffended with a new violent crime over a ten-year period. However, when they considered only those incarcerated persons with severe psychopathologies (as identified by the PCL-R), this rate rose to 77%.

5.6.3.2 Factors related to recidivism

Two types of variables may be used to predict recidivism: static factors (which do not change, such as previous convictions) and dynamic factors (which can change). Among the dynamic factors are stable dynamic factors, which may fluctuate slightly, albeit very little, such as cognitive distortions and sexual preferences, and acute dynamic factors, which can change rapidly, such as emotional states and victim access (Proulx and Lussier, 2001).

According to Hanson and Brussière (1998), the best predictors of sexual recidivism are deviant sexual preferences that are evaluated phallometrically, characteristics of previous sex offences, premature ending of treatment and criminal lifestyle (such as previous sex offences, assault of victims unknown to the offender, absence of a family relationship with the victim, commission of the first sexual offence at an early age, preference for male victims and the varied nature of sex crimes). Among the demographic variables studied in the meta-analysis, only age and marital status were linked, albeit slightly, to sexual recidivism. Note that despite the links reported by Hanson and Brussière (1998) among the various factors and the recidivism risk, the correlations

reported are not typically high. The authors attribute these modest correlations to the low base rate of recidivism reported in several research studies reviewed.

As regards relapses of violence, the varied nature of sexual offences and psychological characteristics (such as an antisocial or psychopathic personality) have been linked to recidivism (Hanson and Brussière, 1998). Trends in demographic variables are replicated since age and marital status seem to equally predict the repeat of non-sexual violence. Note that rapists appear to have a greater tendency than child molesters to repeat non-sexual violent offences.

Harris, Rice and Cormier (1991) mentioned factors linked to an individual's past, childhood, offence for which he was incarcerated, and institutional factors, such as the treatment program, in predicting the repeat of non-sexual violent offences. The authors point out, however, that the PCL-R score provides an indication of recidivism that is as effective as the sum of all these variables.

Concerning general recidivism, Hanson and Brussière (1998) include in their definition the presence of any new crime or offence. The best indicator of general recidivism seems to be the individual's criminal record (which corresponds to Wood's observation, 2006), an antisocial personality and the presence of psychopathology. The findings of Gendreau, Goggin and Little (1996) also point out the link between these factors and recidivism risk. Norko and Baranoski (2007) observed a link between certain psychopathologies and the prediction of recidivism, although this link is small. In general, sex offenders have a slightly higher recidivism risk if they choose to end their treatment prematurely. The work of Hepburn and Albonetti (1994), who evaluated recidivism among drug traffickers, also emphasizes the importance of treatment programs to the prevention of a relapse. Finally, the same demographic factors linking sexual, violent recidivism (including the individual's age and marital status) were brought to light in the prediction of general recidivism.

The factors linked to recidivism in young offenders are not as well known and research findings seem to diverge somewhat. First, certain risk factors observed in adult populations, such as previous criminal convictions, seem to be replicated with young offenders (Catchpole and Gretton, 2003). A study conducted by Stoolmiller and Blechman (2005) clearly shows the use and abuse of illegal substances in the prediction of recidivism in youth. However, the study by Cottle, Lee and Heilbrun (2001) seems to indicate that only the abuse of illegal substances, and not their irregular use, would be an indicator of recidivism. Catchpole and Gretton (2003) confirmed the link between regular drug use and recidivism in this population. In addition, although the presence of a severe pathology would truly seem linked to general recidivism in adults, the results are slightly different for youth. Catchpole and Gretton (2003) noted a link between pathology and recidivism. However, a meta-analysis indicated that this trend does not seem to be replicated with youth (Cottle, LeeandHeilbrun, 2001). One hypothesis that might explain this result is the typically small number of diagnoses of severe pathologies reported before adulthood.

5.6.3.3 Measures for assessing the recidivism risk

Various actuarial measures are frequently cited in the assessment of recidivism risk in incarcerated populations, such as, for example, the *Rapid Threat Assessment for Sexual Offense Recidivism* (RRASOR*), Psychopathy Checklist - Revised* (PCL-R), *Sex Offender Risk Appraisal Guide* (SORAG), *Minnesota Sex Offender Screening Tool – Revised* (MnSOST-R), *Violence Risk Appraisal Guide* (VRAG), *Static-99*, *Static-2002*, *Risk Matrix 2000* (RM2000) and *Sexual Violence Risk-20* (SVR-20). Although the majority of these measures were designed over the past twenty years to assist clinicians working with sex offenders, Barbaree, Seto, Langton and Peacock (2001) noted that the validity of these instruments often extends to several groups of aggressors.

The RRASOR includes four items, which makes it easy, efficient and convenient to administer (Bartosh, Garby, Lewis and Gray, 2003), and the results obtained may vary from 0 to 5. Based on a follow-up period of ten years, a score of 0 implies a 6.5% probability of recidivism, while a score of 5 indicates a 73.4% probability of recidivism. This scale was developed from various samples of sex offenders. In their study, Barbaree, Seto, Langton and Peacock (2001) found that the RRASOR was a good indicator of risk of sexual, violent and general recidivism. Bartosh *et al*. (2003) noted that this scale was particularly useful for predicting forms of violent and general recidivism and moderately useful for predicting sexual recidivism with child molesters. However, in their study of 548 sex offenders, Parent, Guay and Knight (2008) noted that the RRASOR did not allow for the significant prediction of any type of recidivism (sexual, violent or non-violent and sex crimes without contact with the victim, such as voyeurism or exhibitionism) over a five-year period with assaults on females. With child molesters, the RRASOR predicted only sexual recidivism. The authors concluded that the predictive validity of this instrument is generally marginal. The greatest limitation of the RRASOR resides in the fact that this measure is made up entirely of static factors and thus does not allow for the possibility of evaluating possible changes in, for example, the risk of relapse following clinical treatment (Proulx and Lussier, 2001).

The PCL-R involves semi-directed patient interviews as well as information from the patient's criminal record. The PCL-R score is determined by the absence, indication (a few signs or symptoms suggesting the possible presence of a trait, but inadequate information not allowing the determination of a true presence of the trait) and the presence of various traits, such as impulsiveness and certain components of the criminal record and is frequently combined with other actuarial measures such as the VRAG. In the study by Barbaree *et al*. (2003), the PCL-R managed to predict violent and general recidivism but not sexual recidivism. In concordance with this result, Harris, Rice and Cormier (1991) reported a moderate correlation between the PCL-R and violent recidivism. Parent, Guay and Knight (2008) observed that the PCL-R would constitute the best instrument (of the eight presented here) to predict sexual recidivism and violent recidivism in offenders against women. It also provided a significant prediction of non-violent recidivism in offenders against women as well as sexual recidivism and non-violent recidivism in child molesters. Predictive validity fluctuated from marginal to modest.

The VRAG consists of twelve items, including the PCL-R score. Scores can vary from -26 to 38, and individuals may be assigned an ordinal score from 1 to 9, with each grade representing a 5% increase in the risk of violent recidivism in a population where the average recidivism rate is 31% over a seven-year period. The VRAG does predict violent, sexual and general recidivism according to Barbaree *et al*. (2001). According to Parent, Guay and Knight (2008), the VRAG significantly predicts violent and non-violent recidivism in offenders against women, but not

sexual recidivism. The VRAG apparently predicts sexual recidivism for child molesters and appears to be the best instrument for predicting non-violent recidivism. It would not, however, predict violent recidivism for this clientele. Its predictive validity would be considered marginal. However, these results remain lower than the values reported by Harris and Rice (2007), who describe a predictive validity that is at least moderate. Finally, one study seems to indicate that the VRAG would be a less effective instrument when used on schizophrenic patients or inmates (Grann, Belfrage and Tengström, 2000).

The SORAG includes fourteen items (ten being shared with the VRAG) and the results obtained may vary from 1 to 9. Sex offenders obtaining a score of 1 over a ten-year period demonstrate a 9% probability of reoffending, while Proulx and Lussier (2001) reported that aggressors with a score of 9 have all reoffended. Barbaree *et al*. (2003) reported in their study that the SORAG seemed to predict relapse in sexual, violent and general offences. Bartosh *et al*. (2003) confirmed that the SORAG proved useful for the prediction of all these forms of recidivism, involving child molesters, rapists and sex offenders who had no physical contact with their victims (such as voyeurs). Parent, Guay and Knight (2008) indicated that the SORAG would provide a significant prediction of sexual, violent and non-violent recidivism for offenders against women, as well as sexual and non-violent recidivism in child molesters (but not violent recidivism). However, its predictive validity would generally be marginal. The SORAG measures both static and dynamic variables.

The *Static*-99 was designed for adult males who have committed at least one sexual assault and includes ten items, four of which are on the RRASOR. The *Static-99* has been successful in predicting violent, sexual and general recidivism (Barbaree *et al*. 2001). The *Static-99* has also successfully predicted violent, sexual and general recidivism for child molesters, rapists and sex offenders who have no physical contact with their victims (Bartosh *et al*., 2003). In the study by Parent, Guay and Knight (2008), this instrument obtained the best results in the prediction of sexual recidivism in child molesters and also predicts non-violent (but not violent) recidivism for this clientele. It would also significantly predict sexual, violent and non-violent recidivism in aggressors against women. Its predictive validity would vary from marginal to moderate depending on the type of offence.

The *Static*-2002 constitutes an attempt to improve on the *Static*-99. Intended for the same clientele as the latter, the new version includes fourteen items. The study by Parent, Guay and Knight (2008) demonstrated that this instrument could significantly predict sexual, violent and non-violent recidivism in aggressors against women, as well as sexual, non-violent recidivism for child molesters. In general, however, this new version would be slightly less effective than the *Static*-99. Its predictive validity would generally be marginal.

The MnSOST-R includes sixteen items covering the patient's past and institutionalization. The instrument makes it possible to classify an offender based on an ascending scale of recidivism risk from 1 to 6. Each interval represents a 5% increase in risk, based on an average recidivism rate of 35% over a period of approximately six years (Barbaree *et al*., 2001). Barbaree *et al*. (2001) found that the MnSOST-R could effectively predict violent and general, but not sexual, recidivism (which is what the scale was actually supposed to predict). However, the authors explained this result by the divergent nature of the measure of sexual recidivism used in their study. The findings of Bartosh *et al*. (2003) somewhat reflect those of Barbaree *et al*. (2001),

according to which the MnSOST-R predicted general and violent recidivism, but only moderately predicted sexual recidivism in child molesters. Parent, Guay and Knight (2008) observed that this instrument would significantly predict sexual, violent and non-violent recidivism in aggressors against women and children. However, its predictive validity would be marginal.

The RM2000 targets adult males convicted of at least one sexual offence and uses information available in the offender's file. This instrument is divided into two sub-scales (the RMS and the RMV) aimed at predicting sexual and violent recidivism respectively. The RM2000 (or RMC) combines the scores of both instruments. During their research, Parent, Guay and Knight (2008) confirmed the ability of the RMS to predict sexual recidivism in child molesters and aggressors against women. This portion of the RM2000 demonstrated a predictive validity fluctuating from marginal to moderate in the prediction of sexual recidivism, and also predicted non-violent recidivism for both clientele, but only marginally. The RMV constituted the best instrument to predict violent and non-violent recidivism for aggressors against women (modest predictive validity) as well as to predict violent recidivism in child molesters (marginal predictive validity). It also predicted non-violent recidivism in child molesters (marginal predictive validity).

Finally, the SVR-20 is based on structured clinical judgment, including twenty items covering three areas, namely psychosocial adaptation, sexual offences and projects. In the study by Parent, Guay and Knight (2008), the SVR-20 significantly predicted sexual recidivism, violent recidivism and non-violent recidivism in aggressors against women. For child molesters, only sexual recidivism and non-violent recidivism could be predicted. The predictive validity of this instrument was marginal, even though it included both static and dynamic variables.

The findings of the aforementioned studies suggest the importance of monitoring factors that are dynamic, stable and precise in order to efficiently predict recidivism. Thus, several researchers, such as Webster, Hucker and Bloom (2002), Norko and Baranoski (2007) and Gendreau, Goggin and Little (1996) reflect the importance of including factors that are both dynamic and stable in the assessment of recidivism risk. However, actuarial measures of recidivism risk only rarely include dynamic variables and focus more on unalterable factors such as the inmate's age and previous convictions. The latter variable remains the best indicator of recidivism risk.

Psychopathy seems to predict the recidivism of sex offenders (adults or adolescents) and reinforces the idea that it could contribute to commission of the offence (Gretton, McBride, Hare, O'Shaughnessy and Kumka, 2001; Parent, Guay and Knight, 2008). Gretton, McBride, Hare, O'Shaughnessy and Kumka (2001) noted that "The strong association between psychopathy and crime is a natural consequence of the interpersonal, affective, and behavioural features that define the disorder" (p. 428). Schetky (2002) added that "Neurological impairment is likely to be associated with persistent violence, and many studies show that a disproportionate percentage of repeat offenders have some evidence of brain dysfunction" (p. 235).

Overall, the predictive validity of these instruments is relatively weak and has plateaued for several years; at best, a repeat offender chosen at random has a 70% to 75% probability of having obtained a higher score with an actuarial instrument than a non-recidivist also randomly chosen (Parent, Guay and Knight, 2008). Grann and Långström (2007) suggested that the hypothesis according to which the predictive validity of actuarial instruments could be increased by balancing the variables taken into consideration did not appear able to be empirically confirmed.

Schetky (2002) also pointed out that clinicians have little success in predicting long-term violence and added that "Psychiatrists are often asked by the courts or others to predict violence when in fact they are ill equipped to do so" (p. 238).

5.6.3.4. Limits of recidivism studies

Certain methodological limits inherent to studies of recidivism risk assessment warrant consideration here. First, the recidivism rates that were the basis for the evaluation of these measures vary from one study to another. These variations seem to be caused by three main factors: (1) the follow-up period (Cottle, Lee and Heilbrun, 2001; Harris and Rice, 2007), (2) the definition of recidivism recommended by the researchers, and (3) the inclusion or exclusion of forms of recidivism unrelated to the initial conviction. More specifically, certain authors conservatively took a new conviction appearing on the individuals' criminal records and referred to it as recidivism. However, this excludes a large number of cases of recidivism since, according to Proulx and Lussier (2001), about 10% of the sexual assaults are reported to police and, among those, only half will result in a new sentence. However, the researchers who use non-official sources (such as self-disclosure) to obtain an abundance of data frequently point out deficiencies (Barbaree *et al*., 2001). In addition, certain researchers focus specifically on cases of recidivism related to the type of crime that led to the individual's incarceration (such as child molestation).

Such studies will report relapse rates that are statistically lower than studies including any form of new offence in their assessment of recidivism. A study by Sjöstedt, Långström, Sturidsson and Grann (2004) suggested that sex offenders could be twice as likely to reoffend with a non-sexual offence than with a sex crime. Next, it should be pointed out that these studies are not required to use subjects who are most likely to reoffend, since these individuals generally remain incarcerated for a longer period.

Finally, given that the population of men incarcerated for violent or sex crimes is significantly higher than the population of incarcerated women, it is not surprising that almost all studies on recidivism risk have used entirely male samples. To fill in the gap, Bonta, Pang and Wallace-Capreta (1995) conducted a study aimed at exploring the factors related to recidivism in an incarcerated population of women. It is interesting to note that, outside of the static variables, the factors associated with a recidivism risk typically observed in men did not seem to be replicated in women (Bonta *et al*., 1995). Other studies are required to focus better on the factors related to recidivism risk in the female population.

A current trend seems to be toward an approach that would combine the clinical and actuarial methods so as to take into account the particular elements of a given case and statistical risk factors (Dolan and Doyle, 2000; Webster, Hucker and Bloom, 2002). However, there is not unanimous support for this mix, and certain authors consider the two approaches to be mutually exclusive while the validity of the clinical approach remains to be demonstrated (Harris and Rice, 2007).

5.6.4 Prevention of school shootings

There has been a growing concern with the phenomenon of school shootings since the late nineties. This concern is expressed particularly in professional journals in education, educational psychology and school administration (Hoover, 2008 ; LaFee, 2001; Lavergne, 2007; Webb and Kritsonis, 2006). The impact of these incidents is such that certain educational institutions do not hesitate to consider adopting measures requiring that certain rights and freedoms guaranteed by the constitution be relinquished: " …we pay a high price for clearing the slate, and an even higher price for the civil liberties that prevent us from locking up someone who is simply writing scary stories or sending bizarre e-mail messages" (Newman, 2007).

Included among the preventive measures mentioned is the use of prospective profiling aimed at identifying individuals at risk of engaging in a school shooting and evaluating the risk of following through, based on a list of characteristics presumed to be relatively common among the perpetrators of such acts in the past (Lumsden, 2000; Reddy, Borum, Vossekuil, Fein, Berglund and Modzeleski, 2000).

5.6.4.1: School shooting scenes

From 1974 to 2000, the U.S. dealt with a total of 37 school or university shootings resulting in a total of 182 victims. These incidents, which affected 26 states, involved 41 gunmen (Vossekuil, Reddy and Fein, 2000). Canada has had a total of seven incidents in schools and universities since 1975. Compared to other types of risks encountered by school children and students, being a victim of a crazed gunman remains minimal (Mulvey and Cauffman, 2001). This prompted Reddy and colleagues (2000) to say that "People seem to fear school-based homicides most; yet, statistically these events are so rare that the epidemic of concern would seem misplaced" (p. 6).

Vossekuil, Reddy and Fein (2000) studied the incidents that occurred in the U.S. and made the following observations:

- All of those crimes were committed by boys or young men;
- The targets included other students, administrators, teachers or other staff members;
- In over two-thirds of the cases, the attack resulted in at least one victim;
- The weapons most frequently used were handguns, shotguns, or rifles;
- More than half of the attacks took place during school hours;
- School shootings are rarely impulsive. More than half of the aggressors had ideations at least two weeks prior to acting on them and had planned their action at least two days before following through with it;
- Revenge was the motive of more than half of the aggressors, while two out of three had more than one reason;
- More than three aggressors out of four were known to have harboured animosity toward their targets at the time of the shooting. Several had shared this animosity with others;
- In more than three out of four cases, the aggressor informed someone of his plan. Although several persons had been warned, the plan was practically never brought to the attention of adults or competent authorities;
- Although the majority of the aggressors had already handled and had access to weapons, most of them did not show any fascination toward them;
- Half of the attacks lasted less than twenty minutes and ended before the police arrived;

- In several cases, the fact that the aggressors had been victims of intimidation and bullying at school played an important role in their decision to follow through with the act;
- Finally, in almost all cases, the aggressor had displayed attitudes or behaviours prior to the attack that aroused the concern of those around him (other pupils or students, school staff, police, and so on).

The most notable aspect of this portrait is the fact that school shootings are not sudden or spontaneous events; on the contrary, they are planned, the aggressor even frequently shares his criminal plan with people around him, and finally, behavioural clues generally arouse the concern of those around the gunman before he follows through with the shooting. Consequently, school shootings are incidents that are predictable to a certain extent and can potentially be prevented.

5.6.4.2 Prospective profiling in the school environment

The potentially predictable nature of the school shooting has led to the use of two approaches, one centered on the individual (prospective profiling) and the other on factual elements (threat assessment). The first approach will be covered in this section, while the second will be touched on briefly later on.

Prospective profiling compares the characteristics of a given individual perceived as possibly threatening with a profile established on the basis of a study, generally statistical, of criminals who committed the same offence in the past. In a school setting, this operation is carried out in practice using lists of criteria, psychometric instruments or even software based on the actuarial analysis of a limited number of criteria (Reddy *et al.*, 2000). Several lists of "risk factors" have thus been published by researchers, such as Chandras (2001), Juhnke, Charkow, Jordan, Curtis, Liles, Gmutza and Adams (1999), O'Toole (2000) as well as Trump (2000). However, as noted by Fey (2000), sometimes these lists include significant differences, which poses the problem of choosing the one that will be most adequate. This variability also suggests that there could be no consensus on the "profile" of the crazed gunman.

5.6.4.3 Criticism of prospective profiling

This type of profiling, which is based on lists of criteria, psychometric instruments or software, is almost unanimously criticized because of the many problems it poses in terms of its legality (covered later on) and validity.

First, despite the many lists of criteria that supposedly identify a gunman before a shooting, it is agreed in the scientific community that there is currently no reliable profile of the crazed gunman (Burns, Dean and Jacob-Timm, 2001; Lumsden, 2000; O'Toole, 2000; Reddy *et al.*, 2000; Vossekuil, Reddy and Fein, 2000). In a document prepared by the Critical Incident Response Group of the FBI, O'Toole (2000) states that "At this time, there is no research that has identified traits and characteristics that can reliably distinguish school shooters from other students" (p. 3).

In addition, because of the extremely low base rate, the risk of error (false positives and false negatives) is very high (Juvonen, 2001): "There are severe restrictions on the ability of any predictive strategy (even if reasonably accurate) to identify true positives for a low base-rate

behaviour without also identifying a large number of false positives" (Mulvey and Cauffman, 2001, p. 798).

> Following is a concrete example, for the purpose of demonstration:
>
> Let us try to identify future crazed gunmen in a school of 5,000 students. Suppose that we have a list of criteria that correctly identify 90% of the future gunmen (true positives) and 99% of the innocent people (true negatives), a performance immeasurably high for such an instrument. Suppose also that the school has 10 future crazed gunmen, once again an exaggerated number.
>
> Our instrument allows us to identify 9 out of 10 gunmen, which is fine, but a single gunman is quite enough to cause real damage. In addition, among the 4,990 innocent people, our instrument will identify 1% of the false positives, or 50 students.
>
> Thus, a total of 59 students will be identified as at risk and will require institutional intervention, with all the consequences that are involved. Of these 59 students, only 9 (18%) constitute a real threat while the other 50 (82%) will be labelled wrongly (and it is impossible to determine which ones). Above all, a killer remains unidentified, which means that the threat still has not been eliminated. Remember that this example constitutes an immeasurably optimistic scenario in terms of the effectiveness of prospective profiling.

Note that, although we set the rate of effectiveness for the instrument used in the preceding example, in reality, no data exists on the validity and effectiveness of prospective profiling instruments (Reddy *et al.*, 2000).

Next, this approach is susceptible to perceptual and judgment biases (Kahneman and Frederick, 2002; Reddy *et al.*, 2000) and neglects to take environmental factors (risk and protection factors) into account in its assessment of the threat (Mulvey and Cauffman, 2001).

Consequently, as summed up by Reddy and his colleagues (2000): "The use of profiles is ineffective and inefficient, carries with it a considerable risk of false positives […], has a potential for bias, and has been sharply criticized for its potential to stigmatize students and deprive them of civil liberties" (p. 24). Mulvey and Cauffman (2001) add that "The reality of prediction, however, is that this is a largely futile task. The fuzziness of the categories, the base rate of the behaviour being predicted, and the time frame to which the prediction applies must always compromise any identification scheme for schoolyard killers" (p. 800).

Thus, the authors agree, that the risks of prospective profiling are enormous while its potential is limited at best. No empirical data seems to be available on the prediction of this type of crime.

5.6.4.4 Legal considerations

Bailey (2001) has stated that as long as profiling is used solely for investigation purposes (questioning, searches) and in accordance with the legal requirements of formation of reasonable

doubt, it could be a valid tool. In the case of prospective profiling, "The greatest legal objection is that it somehow implies that youth may be deprived of certain rights or opportunities based on their *potential* for violent or criminal acts, rather than the act or wrongdoing itself"(p. 145). In the eyes of criminal law, such an approach is unacceptable because of the presumption of innocence that applies to every individual, especially insofar as profiling criteria are currently divergent from one source to another and the validity of the diagnostic instruments has yet to be empirically demonstrated. At the very most, prospective diagnosis seems likely to help recommend psychological assessments and services, although on a voluntary basis.

5.6.4.5 Threat assessment

In the U.S., the FBI and Secret Service are both frequently faced with tasks similar to the prevention of school shootings (such as prevention of presidential assassination attempts). These agencies operate along a different line of logic than prospective profiling; instead they adopt the threat assessment approach (O'Toole, 2000; Reddy *et al.*, 2000).

Unlike prospective profiling, centred on assessment of the individual, threat assessment focuses on the evaluation of facts that lead to the belief in the existence of a potential threat. That is to say that the assessment process begins *after* a threat has been identified. The threat may consist, initially, simply of a concern that a school staff member or a student has with respect to the behaviour of another individual. This concern is then communicated to a person or committee responsible for evaluating content and urgency. This supposes that measures have been implemented to ensure threat assessment and appropriate follow-up as required. Since few schools have expertise in the area of threat assessment for violence, close collaboration with the police is indispensable.

However, the approach goes beyond the mandate of this report, which focuses on the study of the effectiveness of profiling. Nevertheless, readers who wish to learn more about the application of threat assessment in schools can refer to *The School Shooter: A Threat Assessment Perspective* (O'Toole, 2000).

5.7 Conclusions

5.7.1 Summary

Of all the fields studied, there is practically no empirical support for the effectiveness of prospective profiling. In addition, the actuarial approach, based on risk assessment, now seems to be the favoured one. It is the approach adopted by the Canada Border Services Agency and the National Parole Board. Although profiling seems to have provided convincing results, the actuarial approach has demonstrated more effectiveness than heuristic profiling without exception. In most cases, no statistical link can be convincingly established between an ethnic group and a given form of criminality in racial profiling. Given this absence of a statistical link,

at least theoretically, ethnic origin *should have only marginal, if any, weight in the algorithm for calculating risk level in actuarial instruments.*

Profiling based wholly or partly on sociodemographic characteristics is particularly sensitive to various forms of substitution, which for criminal organizations involves changing the profile of their agents. This tactic in particular has been successfully applied by terrorist organizations (such as the Tamil Tigers, who chose a woman to assassinate Rajiv Gandhi during the suicide bombing in 1991). It is imperative to realize that certain risks of prospective profiling also apply to the actuarial approach. Thus, although the risk factors have been publicized or can be easily deduced, the danger of substitution remains. In addition, even the actuarial approach does not help prevent a highly improbable event (as illustrated by the popularized work by Nassim Nicholas Taleb: *The Black Swan. The Impact of the Highly Improbable*, 2007). Hence the importance of having continuous access to credible, relevant information sources that makes it possible to 1) better calibrate actuarial instruments and 2) maximize the chances that a specific yet unlikely event can be averted as long as agencies are alerted to it. The sharing of information among security agencies follows as a consequence.

Our survey of scientific literature has not allowed us to legitimize the practice of prospective profiling on scientific, legal or moral grounds, or advocate threat assessment for events that, statistically speaking, are extremely rare. However, the actuarial method seems to have yielded results, albeit modest, in preventing cross-border narcotics trafficking and predicting recidivism, two areas where offences are numerous enough for statistical compilation and where information is readily available, especially in the case of already incarcerated individuals. In such a context, we can only recommend that law enforcement agencies exercise caution regarding the weighting and role they give these methods as it relates to low-frequency crimes.

5.7.2 Limits

The limits related to this part of our research are significant. Although it was possible to study several empirical research reports on racial profiling in connection with anti-drug trafficking and the prevention of recidivism for violent or sex offenders, no empirical data allowed us to really evaluate the actual effectiveness of prospective profiling or actuarial methods to combat school shootings and terrorism. Given the relative rarity of this type of event and the difficulty of obtaining credible information on incarcerated terrorists, it is difficult to even imagine a research paper that would satisfactorily answer this question. In addition, the agencies responsible for preventing terrorism do not seem inclined to share information.

5.7.3 Recommendations

[R6] – Agencies should continue to use actuarial methods rather than prospective profiling or clinical judgment for threat assessment.

[R7] – To optimize threat assessment, particularly with respect to terrorism, it is crucial for agencies to have credible, current and relevant information. Intelligence services should have a

way to obtain this information in Canada as well as abroad, while respecting the Constitution and international law.

[R8] – The sharing of intelligence among agencies, particularly the RCMP, CSIS and the CBSA, should be encouraged and optimized.

[R9] – Performance criteria should be developed for the various actuarial tools used by the agencies. The actual effectiveness of instruments should be periodically evaluated (which ties in with a recommendation in the 2007 report by Auditor General S. Fraser with respect to the CBSA).

[R10] – Ethical standards should be developed to govern the practice of threat assessment from an actuarial perspective.

6. Judgment in uncertainty

6.1 Definitions

Judgmental heuristics constitute a type of cognitive shortcut for quickly assessing a situation: "The term *judgmental heuristics* refers to a strategy—whether deliberate or not—that relies on a natural assessment to produce an estimation or a prediction" (Tversky and Kahneman 2002, p. 20). This theory takes into account the limited analytical capacities of the human brain as well as constraints such as time in which the individual must sometimes make decisions. Gigerenzer and Todd (1999) postulate two types of heuristic reasoning: "satisficing" and "fast and frugal heuristics," which suppose that human cognitive capacities are limited. Satisficing implies that, while an individual seeks to make decisions based on the largest possible number of resources, the cognitive capacities of human beings are limited and the environmental structure they must actually operate within is restrictive. Consequently an individual must apply approximative methods to arrive at satisfactory decisions in a real situation. Fast and frugal heuristics suppose that the individual not only has limited time, knowledge and cognitive capacities, but also that he seeks to make the best decision according to limited access to resources. Effective decision heuristics take full advantage of the way information is structured in the individual's environment, which facilitates the choice of the best decision in a given situation. Gigerenzer and Todd (1999) maintain that heuristics, as opposed to solely analytical or rational models, better reflect the way people operate in real decision-making situations.

However, these heuristics lead to predictable biases. Among the best documented biases are the representativeness bias, weighting bias, cognitive availability bias and mental contamination. The representativeness bias constitutes "…an assessment of the degree of correspondence between a sample and a population, an instance and a category, *an act and an actor* or, more generally, between an outcome and a model" (Tversky and Kahneman 2002, p. 22, emphasis is ours). This type of bias explains, for example, why people often tend to associate certain types of individuals with certain acts without regard to real probabilities. Weighting biases " … arise when cues available to the judge are given either too much or too little weight" (Kahneman and Frederick 2002, p. 53). These biases can be noted when an individual puts an exaggerated amount of weight

on certain prominent features such as race, even though in reality they have little impact on the result of the prediction. The cognitive availability bias supposes that "… one basis for the judgment of the likelihood of an uncertain outcome is cognitive availability; that is, the ease with which this outcome can be pictured or constructed" (Sherman, Cialdini, Schwartzman and Reynolds 2002, p. 98). Thus, the probability of certain phenomena occurring would often be estimated heuristically, not on the basis of actual frequency, but based on the how easy the assessor can recall instances of this phenomenon. Finally, the mental contamination bias consists of "…unconscious or uncontrollable mental processing that results in unwanted judgments, emotions, or behaviour" (Chapman and Johnson 2002, p. 185). This bias occurs when a person, consciously or not, includes information in his judgment that is not relevant to the evaluation of the situation.

6.2 The two cognitive systems

What is the origin of this bias? Supporters of this heuristic decision theory propose the hypothesis of a dual cognitive system: intuitive on the one hand, and rational on the other (Kahneman and Frederick, 2002). Since an in-depth analysis of a situation constitutes a time- and energy-consuming cognitive task, "… judgments are generally the products of nonconscious systems that operate quickly, on the basis of scant evidence, and in a routine manner, and then pass their hurried approximations to consciousness, which slowly and deliberately adjust them" (Gilbert 2002, p. 167).

From an evolutionist perspective, this hypothesis makes sense: it is likely that the human brain had to develop based on situations where quick decisions were more important than analytical precision. Insofar as the heuristic system regularly provides optimal approximations in terms of cost and benefits, it remains useful in a good number of situations. However, biases appear when this system provides an estimation that has not been analyzed or adjusted by the rational system because the cognitive task seems routine, because its importance or difficulty is underestimated or because environmental constraints do not allow it.

6.3 Cognitive biases

In our modern world of problems and complex and ambiguous situations, biases caused by the heuristic treatment of information are frequently observed. For example, people tend to overestimate the probability of occurrence of events that are relatively rare but striking or easy to recall (Sherman *et al.*, 2002 ; Tversky and Kahneman 2002). Such is the case, for example, of school shootings, where the probability seems widely exaggerated in popular imagination.

In addition, the fundamental rule of the attribution theory stipulates that "When a behaviour occurs in the presence of a sufficiently strong, facilitative force, an observer should not infer that the actor is predisposed to perform that behaviour" (Gilbert 2002, p. 168). However, it is not generally that way. In practice, people attribute the behaviour, attitudes and speech of others to their personality rather than to environmental factors. Human beings also seem susceptible to mental contamination, as attested by the Pygmalion effect, for example. Moreover, once the

contamination takes effect, it becomes difficult to counter cognitive biases or "recalibrate" the evaluative process (Wilson, Centerbar and Brekke, 2002).

Despite the existence of these biases and the fact that they frequently lead to erroneous predictions, men and women frequently demonstrate excessive confidence in their ability to predict rare events, which poses an obstacle to the correction of cognitive biases (Dunning, Meyerowitz and Holtzberg, 2002; Griffin and Tversky, 2002). Armor and Taylor (2002) add that "One of the most robust findings in the psychology of prediction is that people's predictions tend to be optimistically biased. By a number of metrics and across a variety of domains, people have been found to assign higher probabilities to their attainment of desirable outcomes than either objective criteria or logical analysis warrants" (p. 334). Thus, not only is judgment often distorted in situations of uncertainty, but individuals, far from being aware, tend to overestimate the fairness of their predictions and the extent of their abilities.

6.4 Application to the study of profiling

These biases have notably been studied in various clinical judgment contexts where it was demonstrated that clinical judgment had been systematically surpassed by actuarial judgment (Dawes, Faust and Meehl, 2002). For example, the reliability of clinical judgment is consistently low, which means that clinical judgment based on the data will often produce different predictions. This observation may be verified in a study of the same case by several clinicians, or even by the same clinician but at different times. In contrast, actuarial tools demonstrate perfect reliability because they are based on stable rules of decision-making (the same data will always lead to the same prediction). However, clinical judgment becomes useful in the case of a rare, unforeseen event, which does not use actuarial instruments but can still have a significant impact on the result; only the clinician can take this into account in the assessment.

What makes clinical judgment so difficult is that human beings have impressive observation and information gathering capabilities that sometimes surpass the analytical capabilities of the cognitive function. Consequently, Dawes, Faust and Meehl (2002) note that "Such factors as fatigue, recent experience, or seemingly minor changes in the ordering of information or in the conceptualization of the case or task can produce random fluctuations in judgment" (p. 724). Moreover, quite early in the analytical process, the clinician often forms an implicit hypothesis that subsequently guides his search for information and his interpretation: "The formation of […] false beliefs is further compounded by a decided human tendency to overattend to information consistent with one's hypotheses and to underattend to contradictory information […]. The result is that mistaken beliefs or conclusions, once formed, resist counterevidence…" (Dawes, Faust and Meehl 2002, p. 725). This bias has also been observed during investigations, although police officers are less likely to hold it than individuals without policing experience (Ask and Granhag, 2005).

This results in consequences for the practice of profiling that go beyond clinical judgment in the prediction of recidivism. For example, the decision heuristics theory was notably developed in reaction to empirical anomalies in the theory of rational choice. The latter is basic to several approaches in criminology and is an integral part of the theoretical framework of geographic

profiling and the actuarial approach of prospective profiling (Durlauf, 2005, 2006; Harcourt, 2003). According to empirical studies conducted to date, it nevertheless seems that the explanatory power and predictive validity of decision heuristics theory lead us to doubt the validity of the rational choice theory in several situations related to criminality. Thus, the concept of elasticity, postulated by Harcourt (2003), is susceptible to a conceptualization of choice based on the heuristic model. However, the consequences could be less significant for the theorization of geographic profiling insofar as the concept of opportunity (Felson and Clarke, 1998) retains its meaning regardless of which cognitive mechanism is used to evaluate it.

Finally, the heuristic model questions any instance where profiling, particularly prospective profiling, is based solely on the discretionary judgment of officers; the case of female African-American profiling at the O'Hare Airport in Chicago (Schauer, 2003) is one example. However, actuarial profiles applied in analogous situations (such as the Detroit Airport) seem to have met with some success.

The simplest (but least realistic) way to monitor certain biases such as mental contamination is pure and simple avoidance of stimuli that could undesirably influence our cognitive response (Wilson, Centerbar and Brekke, 2002). Otherwise, Tetlock (2002) noted that the obligation to spell out arguments that have led to a decision, from the perspective of accounting for an audience whose opinion is not known in advance, may cause a drastic decrease in judgment biases. However, applying such a measure could prove difficult and unpopular since it would be perceived as excessive red tape.

7. General conclusion

Our mandate consisted of evaluating empirical support for the practice of profiling within the context of application defined by the *Canadian Human Rights Act.* Thus, we explored three types of profiling: 1) criminal profiling, 2) geographic profiling, and 3) prospective profiling.

We first noted, based on the published research, that the systematic effectiveness of criminal profiling had not been empirically demonstrated. However, we cannot conclude from this that the practice has no merit; instead, the limits of the existing literature do not allow us to generalize conclusions in terms of the Canadian context, where profilers are trained by the ICIAF rather than being self-proclaimed. The position of the courts therefore seems reasonable: profiling may possibly be seen as an art that is useful to the police investigation process, but it cannot currently claim to be a science. Therefore, we recommend that inferential methods be formalized and lead to the identification of performance indicators and empirical research aimed at evaluating true effectiveness.

More substantial effort has been made to conceptualize geographic profiling and provide solid, empirical support for its partial application, specifically narrowing a research area based on the geographic location of crime scenes. However, the stage preceding the construction of the geographic profile itself, the attribution of a crime series to the same offender, depends on the validity of inferences made in criminal profiling, more precisely linkage analysis. The research reviewed neglects to verify the extent to which analysts perform this task successfully. The true

effectiveness of geographic profiling in police investigations still remains partially unexplored. Accordingly, we recommend that procedures for selecting and entering geographic parameters be standardized and that research activities be extended to evaluate success rates for associating crimes to the same offender under conditions that resemble the authentic practice of geographic profiling (abundance of crime scenes with multiple offenders, extended temporal distribution and so on).

Finally, prospective profiling should be split into two categories: profiling of frequent incidents for which it is possible to compile statistics, and profiling of incidents that have a low base-rate for which it is difficult to construct a reliable statistical portrait of the perpetrators. In the first case, it has been clearly shown that the clinical approach or simple heuristic profiling is ineffective. This observation quickly led to the adoption of actuarial risk assessment measures, which have clearly proven to be more effective. The best documented application in this regard is the assessment of the dangerousness and recidivism risk of incarcerated individuals. Note that in the case of narcotics trafficking and recidivism, race has not been distinguished as a relevant indicator. The use of racial profiling in the fight against drug trafficking has, however, been closely scrutinized. The most reliable data note, at least in the United States, excessive monitoring of certain ethnic minorities in relation to their proportional representation in the population or their crime rate. The counterproductive nature of this practice was also pointed out. This association between criminality and ethnic origin stems more from ad hoc heuristic profiles rather than from valid actuarial risk assessment instruments. In the absence of scientific support for the association between ethnic group membership and criminality and given the direct opposition of racial profiling to the spirit of the Act, this practice is not proving to be justified in the contexts explored. The animosity between the citizens and the State as well as the social stigma that would result from profiling constitute sufficient repercussions to justify this position.

In the second case, with particularly rare incidents such as school shootings and terrorist attacks, no empirical research could be found to support the use of profiling or actuarial risk assessment. With regard to related research on more frequent, well-documented incidents, it is possible to postulate that the actuarial approach would be preferable to prospective profiling based on heuristic criteria, and this is reflected in security agency practices. However, in such a context, even the actuarial approach seems to be susceptible to significant damage because it is has a relatively poor factual basis. Specifically, it seems vulnerable to incidents that are considered statistically improbable based on its criteria and, in the case of terrorism, to various forms of substitution. A significant dilemma arises here between national security and personal rights and freedoms. Given that the individuals targeted have not yet committed the crime of which they are nevertheless suspected, logic and justice dictate that the basis for these suspicions must be particularly solid to justify the resulting pre-emptive attack on personal rights. In the case of rare incidents such as terrorism, the opposite is observed: empirical bases are absent from the scientific literature. The consequences could prove catastrophic for the targeted individual, and security agencies are urged to exercise caution. Another question that arises is this: How can security agencies successfully carry out their mission of protection while respecting the spirit and letter of the law? We have no answer based on our research, but according to Anthony Zinni, retired U.S. Marine Corps (USMC) general and former commander-in-chief of Central Command (CENTCOM), the fight against terrorism was based on intelligence and diplomatic relations with countries harbouring terrorist organizations (Priest, 2003). We therefore recommend that efforts be focused on gathering credible, relevant and current information on the evaluation, whenever

possible, of the performance of actuarial tools and the development of ethical markers for using risk assessment in rare incidents.

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